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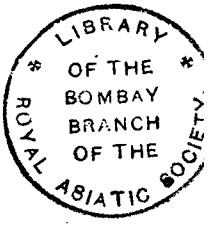
ROYAL COMMISSION ON
AGRICULTURE IN INDIA.

Eighth Interim Report of the Royal Commission on Agriculture in India.

July, 1927.

Presented to Parliament by Command of His Majesty.
September, 1927.



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INTERIM REPORT.

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular, to investigate:—(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (*b*) the existing methods of transport and marketing of agricultural produce and stock; (*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists; (*d*) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of evidence which we have taken up to the 29th January, 1927, on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,
Chairman.
(„) H. S. LAWRENCE.
(„) T. H. MIDDLETON.
(„) J. MACKENNA.
(„) H. CALVERT.
(„) N. GANGULEE.
(„) L. K. HYDER.
(„) B. S. KAMAT.

(Signed) J A MADAN,
(„) F. W. H. SMITH,
Joint Secretaries.

21*st July*, 1927.

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Royal Commission on Agriculture in India.

VOLUME VI.

Evidence taken in the Central Provinces.

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population ;

In particular to investigate—

(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock ;

(*b*) the existing methods of transport and marketing of agricultural produce and stock ;

(*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists ;

(*d*) the main factors affecting rural prosperity and the welfare of the agricultural population ;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

Part I

Question.

1. Research.
2. Agricultural education.
3. Demonstration and propaganda.
4. Administration.
5. Finance.
6. Agricultural indebtedness.
7. Fragmentation of holdings.

Part II

8. Irrigation.
9. Soils.
10. Fertilisers.
11. Crops.
12. Cultivation.
13. Crop protection.
14. Implements.

Part III

15. Veterinary.
16. Animal husbandry.

Part IV

17. Agricultural industries.
18. Agricultural labour.
19. Forests.
20. Marketing.
21. Tariffs and sea freights.
22. Co-operation.
23. General education.
24. Attracting capital.
25. Welfare of rural population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(*a*) Have you suggestions to advance for the better organisation, administration and financing of—

(*i*) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(*ii*) Veterinary research ?

(*b*) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (*a*) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(*c*) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(*i*) Is the supply of teachers and institutions sufficient ?

(*ii*) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(*iii*) Should teachers in rural areas be drawn from the agricultural classes ?

(*iv*) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(*v*) What are the main incentives which induce lads to study agriculture ?

(*vi*) Are pupils mainly drawn from the agricultural classes ?

(*vii*) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(*viii*) What are your views upon (*a*) nature study ; (*b*) school plots ; (*c*) school farms ?

(*ix*) What are the careers of the majority of students who have studied agriculture ?

(*x*) How can agriculture be made attractive to middle class youths ?

(*xi*) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

(*xii*) How can adult education in rural tracts be popularised ?

(*xiii*) In suggesting any scheme for better educational facilities in rural areas, please give your views for (*a*) its administration and (*b*) its finance.

3. Demonstration and Propaganda.

(*a*) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?

(*b*) Can you make suggestions for increasing the effectiveness of field demonstrations ?

(*c*) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?

(*d*) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

(*a*) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?

(*b*) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(*c*) Are you satisfied from the agricultural standpoint with the services afforded by—

(*i*) The Agricultural and Veterinary Services,

(*ii*) Railways and steamers,

(*iii*) Roads,

(*iv*) Meteorological Department,

(*v*) Posts, and

(*vi*) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

(*a*) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?

(*b*) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

(*a*) What in your opinion are :—

(*i*) the main causes of borrowing,

(*ii*) the sources of credit, and

(*iii*) the reasons preventing repayment.

(*b*) What measures in your opinion are necessary for lightening agriculture's burden of debt ? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages ?

(*c*) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale ? Should non-terminable mortgages be prohibited ?

7. Fragmentation of Holdings.

(*a*) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings ?

(*b*) What are the obstacles in the way of consolidation and how can they be overcome ?

(*c*) Do you consider legislation to be necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts ?

PART II

8. Irrigation.

(*a*) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

(*i*) Perennial and non-perennial canals,
(*ii*) Tanks and ponds,
(*iii*) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods ?

(*b*) Are you satisfied with the existing methods of distributing canal water to cultivators ? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical ? Have these methods and devices been successful, or do you wish to suggest improvements ?

(*N.B.*—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(*a*) Have you suggestions to make—

(*i*) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
(*ii*) for the reclamation of Alkali (Usar) or other uncultivable land,
(*iii*) for the prevention of the erosion of the surface soil by flood water ?

(*b*) Can you give instances of soils known to you which, within your recollection, have—

(*i*) undergone marked improvement,
(*ii*) suffered marked deterioration ?

If so, please give full particulars.

(*c*) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation ?

10. Fertilisers.

(*a*) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers ? If so, please indicate the directions in which you think improvement possible.

(*b*) Can you suggest measures to prevent the fraudulent adulteration of fertilisers ?

(*c*) What methods would you employ to popularise new and improved fertilisers ?

(*d*) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(*e*) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated ? If so, what is the result of such investigation ?

(*f*) What methods would you employ to discourage the practice of using cowdung as fuel ?

11. Crops.

(*a*) Please give your views on—

(*i*) the improvement of existing crops,

(*ii*) the introduction of new crops including fodder crops,

(*iii*) the distribution of seeds,

(*iv*) the prevention of damage by wild animals.

(*b*) Can you suggest any heavy yielding food crops in replacement of the present crops ?

(*c*) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(*i*) the existing system of tillage, or

(*ii*) the customary rotations or mixtures of the more important crops ?

13. Crop Protection, Internal and External.

Please give your views on—

(*i*) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(*ii*) The desirability of adopting internal measures against infection.

14. Implements.

(*a*) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery ?

(*b*) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements ?

(*c*) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country ? If so, can you suggest means by which these difficulties may be removed ?

PART III

15. Veterinary.

(*a*) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent ?

(*b*) (*i*) Are dispensaries under the control of Local (District) Boards ? Does this system work well ?

(*ii*) Is the need for expansion being adequately met ?

(*iii*) Would you advocate the transfer of control to Provincial authority ?

(*c*) (*i*) Do agriculturists make full use of the veterinary dispensaries ? If not, can you suggest improvements to remedy this ?

(*ii*) Is full use made of touring dispensaries ?

(*d*) What are the obstacles met with in dealing with contagious diseases ? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection ? Failing legislation, can you suggest other means of improving existing conditions ?

(*e*) Is there any difficulty in securing sufficient serum to meet the demand ?

(*f*) What are the obstacles in the way of popularising preventive inoculation ? Is any fee charged, and, if so, does this act as a deterrent ?

(*g*) Do you consider that the provision of further facilities for research into animal disease is desirable ?

If so, do you advocate that such further facilities should take the form of—

(*i*) an extension of the Muktesar Institute, or

(*ii*) the setting up, or extension of, Provincial Veterinary Research Institutions ?

(*h*) Do you recommend that special investigations should be conducted by—

(*i*) officers of the Muktesar Institute, or

(*ii*) research officers in the Provinces ?

(*i*) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India ? What advantages do you expect would result from such an appointment ?

16. Animal Husbandry.

(*a*) Do you wish to make suggestions for—

(*i*) improving the breeds of livestock,

(*ii*) the betterment of the dairying industry,

(*iii*) improving existing practice in animal husbandry ?

(*b*) Comment on the following as causes of injury to cattle in your district—

(*i*) Overstocking of common pastures,

(*ii*) Absence of enclosed pastures, such as grass borders in tilled fields,

(*iii*) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,

(*iv*) Absence of green fodders in dry seasons,

(*v*) Absence of mineral constituents in fodder and feeding stuffs.

(*c*) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist ? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive ?

(*d*) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district ?

(*e*) How can landowners be induced to take a keener practical interest in these matters ?

PART IV

17. Agricultural Industries.

(*a*) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year ? What does he do in the slack season ?

(*b*) Can you suggest means for encouraging the adoption of subsidiary industries ? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid ?

(*c*) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc. ?

(*d*) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc. ?

(*e*) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas ? Can you suggest methods ?

(*f*) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances ?

(*g*) Can you suggest any other measures which might lead to greater rural employment ?

(*h*) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment ?

18. Agricultural Labour.

(*a*) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(*i*) areas under cultivation in which there is a shortage of such labour ? and

(*ii*) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(*b*) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(*c*) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(*a*) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(*b*) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(*c*) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(*d*) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(*e*) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(*f*) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(*a*) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(*b*) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(*c*) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(*i*) Indian markets ?

(*ii*) Export markets ?

(*d*) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (*a*) customs duties, both import and export, and (*b*) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(*a*) What steps do you think should be taken to encourage the growth of the co-operative movement—

(*i*) by Government,

(*ii*) by non-official agencies ?

(*b*) Have you any observations to make upon—

(*i*) Credit societies ;

(*ii*) Purchase societies ;

(*iii*) Societies formed for the sale of produce or stock ;

(*iv*) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(*v*) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(*vi*) Societies for the co-operative use of agricultural machinery ;

(*vii*) Societies for joint farming ;

(*viii*) Cattle breeding societies ;

(*ix*) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(*c*) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(*d*) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(*a*) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people ? If you make suggestions, please distinguish, as far as possible, between—

(*i*) Higher or collegiate,

(*ii*) Middle school, and

(*iii*) Elementary school education.

(*b*) (*i*) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land ?

(*ii*) What is your experience of compulsory education in rural areas ?

(*iii*) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class ?

24. Attracting Capital.

(*a*) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture ?

(*b*) What are the factors tending to discourage owners of agricultural land from carrying out improvements ?

25. Welfare of Rural Population.

(*a*) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population ?

(*b*) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators ? If so, what, in your opinion, should be the scope and methods of such enquiries ?

(*c*) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26. Statistics.

(*a*) Do you wish to make suggestions for the extension or improvement of the existing methods of—

(*i*) ascertaining areas under cultivation and crops ;

(*ii*) estimating the yield of agricultural produce ;

(*iii*) enumerating livestock and implements ;

(*iv*) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population ;

(*v*) arranging and publishing agricultural statistics ?

(*b*) Have you any other suggestions to make under this heading ?

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE.

Monday, January 17th, 1927.

RAIPUR.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
RAJA SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. C. U. WILLS, I.C.S.
Sir SHANKAR MADHO CHITNAVIS, KT., I.S.O. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. F. J. PLYMEN, I.A.S., Director of Agriculture, Central Provinces and Berar.

Extracts from Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar referred to by Mr. F. J. Plymen in his replies to the Questionnaire.

CHAPTER I.—Tenures and Holdings.

* * * *

6. *Fragmentation in Chhattisgarh.*—Only in the Chhattisgarh Division is the fragmentation of holdings a serious problem. Elsewhere, though it cannot be said that holdings are compact, the sub-division into separate fields is not so minute as to cause anxiety.

In Chhattisgarh the natural tendency to sub-division inherent in the Hindu and Mahommedan law of succession has been exaggerated by the old time practice of periodical redistribution of the fields in each village so as to ensure that each cultivator got his share of the different kinds of lands. It is common to find a holding of 10 acres scattered about in 40 tiny little plots of land, and the number of fields in a Chhattisgarh village will frequently run to a thousand for every hundred found in other tracts. The evils of such a system in the path of agricultural progress are obvious.

Hitherto there has been little success in efforts at consolidation and such progress as has been made has generally been due to the efforts of the people, usually the landlord, acting alone. The subject was first attacked in 1905, but was allowed to drop from 1907 to 1912, when it was once more taken up. Again the War interfered, but in the past year, the subject has again come into prominence. The chief obstacles to progress are the apathy of the people and the low standard of living that prevails, suspicion of change and especially the feeling that the rich man and not the poor man will be the gainer, proneness to litigation and caste disputes. In addition legal difficulties regarding transfer of rights in exchanged holdings are a considerable hindrance. As an example of what can be effected where there is a readiness to co-operate in the reform the village of Matwari in the Drug district can be instanced. The number of fields when the village, consisting of 827 acres only, was last renumbered, was 2,934. By family sub-division this number rose to 3,651. After consolidation it stands at 243 and the average number of fields held by each cultivator has fallen from 98 to 8. The problem is now engaging the attention of Government. Its solution will require special legislation and special staff, for the failure in the past can partly at least be attributed to the fact that the work was entrusted to busy revenue officers to do what they could in the time they could spare from their regular duties.

* * * *

CHAPTER IV.—Marketing.

21. *Crop movements.*—Cotton goes from the west of the Province almost entirly to Bombay. Some is used in local mills or goes to Ahmedabad but very little eastward to Calcutta. Wheat goes to Bombay, though there is a distinct movement from the wheat and plateau tracts to Berar.

The rice of the Wainganga tract goes chiefly to Nagpur and Berar and some to the Nerbudda valley. That of Chhattisgarh goes partly to Jubbulpore and partly to Calcutta. Though the movement of rice is more active than it was, the export from the Province is not so important as might be expected from the large area under this crop. The oil-seeds export of the Province is considerable and moves chiefly to Bombay.

22. *Market practice.*—Most of the foreign trade is in the hands of a limited number of large firms who have established upcountry agencies in the larger towns. At times, as in the organised cotton markets of Berar, they buy direct from the cultivator but usually they deal through brokers. There are also many local firms of varying importance; these purchase from the cultivator and either sell to the larger firms or consign direct. Below these there are the village *banias* who lend money or grain to the cultivators; they pay low prices, recovering grain in lieu of money or seed advanced. Though reserving some of this return for lending, their surplus goes on to the district markets and is taken up by the bigger firms. Lastly there are the itinerant traders who move from village to village, generally working in the more distant areas, paying something like 10 to 16 per cent below the market rate in grain and often much below this in cotton. These either pay the cultivator on the spot direct or on delivery at the nearest market of any size. In the case of paddy, they generally buy as *dhan* (unhusked). They sell their grain in the district markets to larger merchants.

In tracts of more advanced character, for instance in the rice area of Balaghat, Bhandara and nearer the bigger markets in Chhattisgarh, the grower sells his crops at the big markets on the railway or, near Nagpur, he may bring it into the main central market of that city. There is considerable market competition at these district centres on the railway. Sales and purchases are effected through brokers and commission agents.

At Nagpur the grain is sold by auction and this is coming in elsewhere. Brokerage is charged at the rate of 3 annas per 400 lbs. and the municipal charge is Rs. 2 octroi and 8 annas market charge per cart of about 600 lbs.

The cultivators who bring their produce into the district markets undoubtedly get a better price than when selling to the itinerant trader and very much better one than when selling under the semi-compulsion of debt to their banker, the village *bania*. The open markets, however, have their drawbacks in the form of petty charges, unfair deductions on the score of quality or the presence of a 'ring' of brokers. Moreover as the markets are administered by municipal committees cultivating interests are as a rule not adequately represented. In most markets the prices are not published. This and a more adequate means of dealing with brokers who fraudulently exploit the cultivator would help matters. The formation of co-operative sale societies by members of agricultural associations is, however, the only satisfactory means of getting a fair price in the grain markets.

23. *Cotton marketing.*—Cotton requires separate mention. Marketing practice and conditions vary in the Central Provinces and in Berar. The Berar markets are highly organised and regulated by rules, and on paper they provide an equitable market.

The necessity of guarding the buyer against a cart load being not up to sample is of course necessary, but it is here where the seller is most open to being swindled by unfair deductions once the cart has reached the ginnery, unless, as is not always the case, he is a sufficiently keen businessman to be able to meet the buyer on his own ground.

These markets in Berar have been the subject of a close investigation instituted by the Indian Central Cotton Committee. The results of this inquiry have not yet been published but they indicate that a strict application of the rules to govern these markets will be necessary to prevent a good deal of the fraud at present practised on the seller.

In the Nagpur-Wardha area there is a big central market at Nagpur and a number of smaller ones in the districts. These markets are well organised from the point of view of the purchaser. There is certainly competition but it is organised competition and therefore not unrestricted. The procedure at most markets is that the purchasers acting on telegraphic information from Bombay agree among themselves as to the maximum price they will offer for the best quality of the particular market. They arrive at this maximum price by a sort of auction process—not auction in the ordinary sense of the term, because the price is arrived at before any cotton changes hands or the seller comes into the picture. In other words, it is not the commodity which is auctioned but the price which will be paid. The maximum price for the day is then declared. Business between firms and sellers is carried through by brokers. If the seller's cotton is up to the best standard, he gets the full price. If not, it is subject to deduction in the weight paid for. This is where the broker comes in. He brings the two parties to agreement. Deductions are made on account of dirt, dampness, rain or late picking, and varies in amount according to the place of origin. In markets where good quality cotton is the rule, deduction is very small. An ordinary rate at Nagpur is a deduction of 28 to 40 lbs. per load off the weight paid for. Brokerage is 8 annas a cart.

At one or two markets the practice differs. The price is not fixed and competition is unrestricted, each cart being sold on its merits. The result is that the grower gets about Rs. 2 per *khandi* more at such markets.

CHAPTER V.—Prices, Wages and Labour.

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25. *Shortage of agricultural labour.*—In all agricultural tracts, there has been of recent years a distinct indication of a shortage of labour and with this shortage a marked rise in its price. The intensity of the shortage and the price demanded and paid varies from tract to tract. It is most intense in the cotton tract, less so in the wheat and least in the rice tract, but, generally speaking, the labouring classes have never been so prosperous as they are today.

The shortage is largely due to the influenza epidemic of 1919, but it is also affected by other factors which operate to different extents in different

areas. The rise in the price of labour is in part the outcome of the higher cost of food supplies and in part the result of a shortage of labourers.

The agricultural operations of the cotton tract and the wheat tract would not be possible but for the fact that there is a steady flow of immigrant labour, largely of a seasonal or periodic type, from areas outside the Province and from one area of the Province to another. The rice tracts, however, depend on their own labour supply as also does the plateau, though in both there are certain internal movements.

26. *Wages in the Chhattisgarh area.*—In Chhattisgarh, where the standard of living is low and pressure of population is not sufficiently great to stimulate intense forms of cultivation like transplantation, the price of labour, as compared with other areas, is low. Though principally paid in the form of grain, it may be taken as equivalent to Rs. 7 per mensem for permanent labour and at 4 annas for male and 2 annas 6 pies for women for casual daily labour. In the rice tract, work is plentiful from June to November and in certain sections, where cold weather crops are extensively grown in addition to paddy, it can keep labour employed most of the year. Where, however, the cropping is chiefly restricted to paddy, there is little work after the harvest is once in. Again, in this tract there is a large number of holdings of two to four acres which by themselves are unable to support the owners. These three factors, *i.e.*, a low standard of living, an absence of work for seven to eight months per annum and the existence of a large body of small cultivators whose holdings are entirely inadequate, make this tract the principal area in the Central Provinces from which emigration takes place. The labour of this area is found in other parts of the Central Provinces to the extent of 267,000 and is utilised in the tract itself on irrigation construction work. The Chhattisgarh labourer also migrates in very considerable numbers to the iron and coalfields of Orissa and Bengal and the tea gardens of Assam. As many as 48,000 move to Assam and the majority of 80,000 to the coal and iron industries. A considerable amount of the movement is seasonal in character. The labour leaves after the harvest of the paddy and returns for the sowing. An appreciable amount, derived from the body of small holders who find it more advantageous to make over the farming of their allotments to others, is of longer duration.

Consolidation of holdings which might reasonably be expected to lead to an increase in the intensity of cultivation would undoubtedly affect the labour problem in other areas.

27. *Wages in the Wainganga tract.*—The payment of labour in the Wainganga area, except near the larger towns, is usually in kind. When paid in cash, monthly labour receives Rs. 7 to Rs. 8 and the average daily man labour of a casual character is paid at 4 to 5 annas and women at 2½ to 3 annas per day. The pressure of rural population is greater, holdings are comparatively consolidated and cultivation for the most part is much more intensive and transplantation is common. Seasonal demands for agricultural labour are more acute. A woman at transplanting time may get from Re. 1 to Re. 1-8-0 for three days' work. In addition there is a growing competitive industrial demand, the manganese mines, the *bidi* factories, the industrial claims of Nagpur and to some extent the needs of the cotton tract to the west all competing for casual labour. Labour difficulties are also increased by caste friction. This rice tract thus differs from Chhattisgarh in that its standard of agriculture requires more labour while there are more active outside agencies which compete for an already limited supply when measured by this standard. The man who cultivates his own land does not feel this in the way in which it affects employers. There are areas of land commanded by irrigation which, because of labour shortage, are not utilised and the extension of transplantation as a method of increasing food supplies has been checked, except in the more southern portions which are less affected. In this tract there is a seasonal movement of labour from broadcasting to transplanting areas and also some immigration from the other rice tract.

28. *Migration to the wheat area.*—The labour in the wheat area requires a good deal higher wage than it did, but though the Agricultural Department has the necessary machinery which will materially save labour, it is only recently that the employer of such labour, the bigger grower, has begun to think of the utilisation of machinery and it may be argued that, though he complains about the cost, he is still able to pay the wage that labour demands.

The wheat tract receives its labour at harvest time from two sources. There are two currents of immigration of labour into the Central Provinces, one from the north-east, the other from the south-west. The wheat area takes up most of the north-east flow, which is derived from the Central Indian Agency and the east of the United Provinces and is absorbed in Jubbulpore, Saugor and Damoh. Though a proportion of this is attracted by the industries of Jubbulpore, a very coniderable mass is of a periodic character and is influenced by the needs of the harvest of the wheat crop. Between 80,000 and 90,000 harvesters come annually into these districts from this source.

The other source of labour in this tract is from the plateau, something like 28,000 to 30,000 coming in annually to seek employment in the western districts of the wheat tract. They are largely aboriginals, Gonds, Korkus and the like, who, having harvested their millets and rice, migrate into the Nerbudda valley. A bad wheat year hits these people very seriously. Though the wheat might be harvested quicker, if there were more labour and though high wages or the equivalent in kind are demanded at harvest time, the really critical season in the wheat tract is the sowing season, when it is dependent on its own supply. Returns are undoubtedly lower owing to the delay which takes place at this season and this probably accounts for the much greater interest taken in an automatic seed drill than in a reaping machine in this tract.

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31. *Migration of labour to the cotton tract.*—There is a distinct immigrant population from outside the boundaries of the Province coming in from the south-west. Thus Nimar in the last census showed 53,000 as against 43,000 in the previous census, but this was in part due to the peculiarity of the conditions of the census year and shortage of water in extra provincial areas. In addition there is a steady flow of population into this district from the west of the plateau.

The southern and border districts of Berar showed 79,000 external immigrants, the vast majority of whom are attracted by trade or by the seasonal labour demand of the gins and the cotton fields.

In the rest of Berar 240,000 of the population recorded in the last census were from other parts of the Provinces. Though possibly to a considerable degree attracted by trade, they include a distinct body of periodic labour influenced by the wages offered at the cotton gins and on the cotton fields. In spite of the natural increase in population and an inflow from Bombay and Hyderabad and from other parts of the Central Provinces, a certain definite percentage of which is undoubtedly attracted by agricultural work, there has of recent years been a definite reduction in the amount of labour available for agricultural purposes. All over the tract during the last few years, bigger growers dependent on hired labour, particularly for weeding and picking, have found this difficulty. The high wages offered are due partly to the higher price of necessities and partly to the reduction of available supplies of labour or at least the failure of the supply to meet the extension of area under cotton.

Scarcity in the field is usually attributed to the better wages obtaining at the ginneries during the ginning season. This industrial competition undoubtedly operates at the picking season attracting to the urban centres the natural labour population and also a portion of the periodic immigrant flow, but it does not account for the shortage earlier in the year.

The shortage of field labour is in part due to the withdrawal from the ranks of the agricultural labour population of a part of those who in the past took an active share in the cultivation. The high prices ruling for cotton during the last decade and the money coming in on this account to small holders have tended to reduce the number of women seeking employment in the fields, the need for such effort on their part being less. The same cause has led to the conversion of some of the working small holders into direct employers of labour for work they once did themselves, but which the prices obtained for cotton permit them to get others to do. These men thus increase the demand on existing supplies. A fall in the price of cotton will tend to an increase in casual labour, chiefly in the shape of the labour absorbed by this class. With the heavy slump of prices in 1925-26, casual labour at once showed signs of becoming more fluid.

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CHAPTER VIII.—Finance of Agriculturists.

45. *Banking influence.*—The joint stock banks do not play any very direct part in finance. The Imperial Bank in the Central Provinces contents itself with loans to the co-operative banks and thus indirectly assists. The Allahabad Bank finances the bigger grain buyers who can thus at once pay off the grower. The banks advance money against the value of grain brought in by the grain buyer and lodged in the sealed godowns owned by the bank. The advance made is well covered by the grain. When the buyer wishes to dispose of his grain, he pays the banks the original value of such grain as he wishes to remove for sale.

The bigger Indian banks working on indigenous lines are more closely associated with the financing of agriculture. The include bigger professional moneylenders, and their business consists in lending to smaller moneylenders and landlords. The Marwari banker prefers to finance a lender rather than take up mortgages, but the differences between their business and that of the smaller village moneylender is inconsiderable.

The Indian banking houses provide a series of middlemen doing business, the method of which varies from those of a western bank to those of the petty village moneylender.

46. *Causes of indebtedness.*—Agriculture all the world over requires the assistance of borrowed capital. Here, however, capital is scarce and interest high. There is not enough money to enable the country to be farmed as it might be. The agriculturist of these Provinces is subject to the extraordinary fluctuations in values which obtain in India, militating against sound finance and reacting heavily against the small holder. For example, the cotton crop was one year valued at four crores and the next at eleven. Differences like this lead to debt and thriftlessness. If, moreover, the extravagant social customs which bear no relation to individual wealth but are governed by caste needs are taken into account, the causes of his indebtedness can be understood. The lender of money, so long as he only lends and recovers his loan and interest, is a beneficial economic factor; but, unfortunately, this is not always his only form of activity.

Mr. McDougall, in his economic study of a Chhattisgarhi village, shows that six-sevenths of the total debt of the village was for unproductive purposes and that, were it not for the principal and interest which the villagers had to meet on account of such loans, the return from the average whole-time cultivator's land would have left him with a distinct margin of saving over the demands of his annual family budget.

47. *Sources of capital in villages.*—The two commonest village lenders are the malguzar of the village and the village *bania* or *sowcar* who may or may not be the malguzar. The malguzar, if he is a resident cultivator, of the same caste as his tenants and not a land-grabber, is a beneficial lender and the condition of the village is good. But very frequently he is an alien landlord, who aims at getting his tenant as completely as possible into debt and then, taking all his produce, either leaves him just sufficient for bare maintenance or actually deprives him of his land. This class of moneylending landlord is a curse. He represents one of the chief obstacles to agricultural and economic advance. He is prevalent in many parts of the wheat and rice tracts.

The other lender is a *sowcar* not directly connected with village ownership. At most places he is resident in the village; at others he may be itinerant. This class of small village moneylender usually relies on one of the bigger professional lenders for the capital with which he makes his petty loans.

In some areas the malguzar does the seed lending while the village *sowcar* provides the money loans. At others the malguzar combines both functions. At others, again, the cultivator depends on the *sowcar* for both his seed and other requirements.

In Chhattisgarh and in parts of the wheat tract, the landlords and big tenants do most of the lending, while in the Wainganga tract lending is partly in the hands of landlords and partly in the hands of substantial moneylenders. In Berar the moneylender is the source of capital. In the plateau uplands the small *sowcar* is the chief moneylender. In the more backward or roadless districts, the travelling dealer is the source of loans.

Mixed up with lending there is also a good deal of trading. These *sowcars* do a regular business with all but the very substantial tenants. The average

and smaller cultivator maintains a running account with the *sowcar*, disposing of all his produce but repaying advances in order to secure future ones. In many areas, a *sowcar* of one type or another is the village banker and the village trader.

48. *Other sources of financial help.*—Brokers attached to big markets not infrequently make advances to cultivators on the understanding that the borrowers sell all their produce through them in the established markets. Such loans are generally covered by some security, such as land, ornaments or a money bond. In some districts, the owners of ginning factories, who are buyers of cotton, advance money for cotton cultivation on much the same terms as brokers. Again petty dealers, moving from village to village, buy crops in advance and at the time of doing so make advances which are utilised for cultivation.

49. *Types of loan.*—Grain for seed is nearly all advanced by either the malguzar or the *sowcar*, on condition that, after harvest, the seed is returned with the addition of from 25 per cent to 50 per cent of the amount lent. Usually *sawai barhi* or 25 per cent is the commonest interest; but 50 per cent is at times charged in the first instance on a loan of this kind. The terms on a six-month loan look high, but when the difference in seed value at sowing and harvest is considered together with the risk, it is not unfair.

Cash loans take a number of different forms and earn very varying interests.

In the case of small loans—

(1) Interest may be charged at 1 to 1½ annas per rupee per mensem or at 18 to 36 per cent per annum.

(2) A cultivator may borrow on *sawai* taking Rs. 100 in June and giving his bond for Rs. 125 payable in December. If not paid, Rs. 125 becomes subject to compound interest at 25 per cent.

(3) Another system is known as *khat*, whereby the borrower, desiring Rs. 100, executes a bond for Rs. 125 and agrees to repay at the rate of Rs. 5 per month. Before he gets the money, however, he has to pay the first instalment, together with one gratuity of Rs. 5 to the lender's agent and another of Rs. 2 to the bond writer. He thus gets Rs. 88 but has to repay Rs. 120.

(4) Another system is known as *whar*. A loan of Rs. 50 is taken on an agreement to pay a rupee a week for 62½ weeks. The first seven instalments are deducted before any of the loan is paid and a further 6 per cent of the whole loan for various charges. So the borrower gets actually Rs. 40. The money is thus borrowed at 45 per cent interest.

(5) At one time advances against the cotton crop were common but they are nowadays rare. The general method in the cotton country is a cash loan at the beginning of the season at 25 per cent interest payable at harvest.

On bigger loans of Rs. 1,000 or more the security is on land mortgage and interest will range from as low as 12 per cent according to the security offered.

50. *Effects of the system of finance.*—It is difficult to give a clear estimate of the losses which the agriculturist suffers through these methods, but there is no doubt that they often lead to very serious indebtedness, as, for example, one can learn from a study of the conditions which prevailed in the wheat tract subsequent to 1900, when the average debt all over the Hoshangabad district was fifteen times the rent. This, at 24 per cent interest, meant an annual charge of four times the rent.

Sowcars do not encourage borrowers to clear off their advances nor are the borrowers eager to do so. The main cause of debt is the great proportion of such advances which are utilised unproductively. A loan doubles itself in three years under the ordinary compound interest charged and trebles itself in five years. The result very often is the attachment of the whole of the borrower's moveable property except his working capital—in the shape of his bullocks, implements and house furniture. Once a suit is filed the borrower has little chance of getting free. In Bombay under the operation of the Deccan Agriculturists' Relief Act, no more than double the loan can be claimed and repayment can be made in instalments at the discretion of the court. In this Province there is no limit to the total recoverable and the decision as to payment in instalments rests with the creditor.

51. *Taccavi.*—*Taccavi* loans are advanced by Government to cultivators for seed under the Agriculturists' Loans Act and for improvements under the Land Improvement Loans Act. The rate of interest is 1 anna 3 pies per rupee per annum or 7¾ per cent. Though *taccavi* loans can be given for the objects named, their primary function is for the relief of distress and it is in times of crop failure that they are most resorted to. They are intended to supplement and not to supplant the usual sources of credit. The amount of *taccavi* advanced in the crop failures of 1918 and 1920, was Rs. 81,42,297 and Rs. 1,06,00,108, respectively. In 1924-25, which was a normal year, it amounted to Rs. 5,69,424 only. Since 1918, a certain amount of *taccavi* has been placed at the disposal of the Agricultural Department. The figures below show the amounts so utilised for the last few years:—

		Rs.	
1924-25	...	... 72,000	
1925-26	...	... 81,500	
1926-27	...	... 93,000	(provision.)

The amount is only a microscopic fraction of the financial need. It is used by the department to supply implements, machines, manures and seed to cultivators. Cash is rarely given. The implement or manure is supplied to the value of the loan taken. This does away with the temptation to use the money for other purposes. It has been of very considerable value in permitting the spread and use of machinery and the introduction of cake and fertilisers in cane cultivation. Its value for seed supplies is a little more doubtful, as seed is comparatively easily sold and there is not the guarantee that the seed made over to the cultivator by the Government farm under *taccavi* is always actually sown.

Taccavi is unpopular with the *malguzars* and *sowcars* as it interferes with his grain business, nor is it as popular with the cultivator as it might be, because it is usually given for a specific purpose, whereas the *sowcar* can be relied on to make a loan for any purpose, productive or otherwise. To take a *taccavi* loan may thus jeopardise the chances of a loan from the *sowcar*, specially if taken for grain. Another point which tells against its wider use is the fear of not being able to meet payment and the strictness with which payment is enforced.

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CHAPTER IX.—The Relationship of Forestry to Agriculture.

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64. *Experiments in the supply of baled grass for stall feeding.*—As a result of a conference held in 1909, experiments were undertaken for the supply of baled grass from various forest divisions to encourage the stall feeding of cattle by the local agricultural population, but practically no success was attained and often the baled grass that had been stored had to be written off in succeeding years, or disposed of at a loss.

In Damoh, 195 bales, weighing 71 tons, of selected grass were offered for sale at cost price. Of this quantity, only 4½ tons were sold to agriculturists and 62½ tons to other purchasers. In Saugor, 403 bales were prepared and offered for sale at annas 12 per bale. Only 153 bales were sold although the price was lowered to annas 6 per bale, and 250 bales remained unsold and had to be written off. Similar losses were incurred in Nimar, Akola and elsewhere, but the results in North Chanda, Nagpur-Wardha and Yeotmal were more promising, though the largest sales were made in the towns and not to agriculturists.

65. *Fodder and thatching grass.*—By the sale of grass in closed coupes and in grass *birs*, Government does all in its power to encourage stall feeding and thus to diminish the damage done to the forest by the grazing of excessive herds of cattle. Unfortunately, except in a few districts of the Province, *e.g.*, Nimar, stall feeding is little practised with the result that in most divisions the sale of fodder grass is very small. On the other hand, there is a heavy demand for thatching grass which is mostly cut and removed after it has become unfit for fodder. To try and stimulate the demand for fodder grass, lower rates are charged for grass cut up to the end of December, but this concession has little or no effect on sales.

As a result of recent investigations as to the best agency for the sale of grass in closed coupes so as to ensure the supply of cheap grass to cultivators, Government decided that no hard and fast rules could be laid down.

for the Province as a whole. In many areas, the purchasers prefer to buy grass ready cut by contractors even in divisions where equally conveniently situated coupes are set apart for the sale of grass at lower rates on the licence system. In some divisions, on the other hand, purchasers prefer to cut the grass themselves. Accordingly the use of both the licence and the auction systems is permitted. The Divisional Forest Officer discusses with the Deputy Commissioner the arrangements proposed before grass in closed coupes is auctioned, the general wishes of the local population being duly considered.

66. *The supply of fuel and other produce to cultivators.*—A few prescribed villages, usually such as form enclaves within Government forest, or are situated in districts where the demand on the forests is almost wholly confined to the demands of the village, are permitted to commute on payment of a fixed sum every year by each household in the village for the privilege of removing from the forest, at any time during the year and as often as is necessary, certain stated descriptions of produce such as dry fuel, bamboos, grass, thorns, leaves and fibres, all edible roots, fruits, flowers and gums for *bona fide* home consumption and not for barter or sale or wasteful use. The commutation system is only suitable where there is little commercial demand for forest produce; elsewhere, such a system is liable to abuse.

But the more general method of sale of these products to cultivators is by the licence system, i.e., a licence is purchased which entitles the purchaser to remove the specified produce from the forest. Special low rates are fixed for each district for such produce as is taken by *bona fide* agriculturists. Dry firewood is generally taken from any area most suitable to the purchaser, while timber and larger quantities of fuel are purchased at somewhat higher rates in the annual coupes under working. These coupes are usually auctioned to contractors who fell the produce and sell to purchasers, but the system of departmental working of coupes is now becoming more widely adopted. The latter system ensures the proper sylvicultural working of coupes, it gives a larger revenue to the Forest Department by eliminating the middleman's profits and by decreasing the possibility of illicit fellings, and it provides a salutary check on the rates at which produce is sold to cultivators.

67. *Encouragement of the use of firewood as fuel in place of cowdung.*—In the Chhattisgarh plain, attempts have been made to encourage the use of firewood as fuel as opposed to cowdung by the establishment of fuel depôts at suitable agricultural centres. The experiment has unfortunately not proved a success and it has been found necessary to shut down two out of four depôts after incurring a heavy loss. The resolution of Government on the Forest Administration Report for 1918-19 may be quoted in this connection :—

> "It must be admitted that the results so far have not been encouraging, and they afford a curious comment on the allegation sometimes made that the burning of cowdung as fuel is entirely necessitated by the lack of firewood. If the people of the Raipur district continue to burn cowdung, with 160,000 cubic feet of firewood stacked almost at their doors and offered to them at very cheap rates, immemorial custom and a preference for cowdung fuel must be assigned as the reasons for the continuance of the practice, rather than the scarcity of wood fuel."

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CHAPTER XI.—The Agricultural Department.

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86. *Distribution of work.*—The work carried on by the research officers and their staffs is sufficiently indicated by their titles. Each, except the Cotton Botanist, is concerned with the teaching work in his own subject. The second Botanist has been very recently appointed. His work will be concerned with College teaching and research on pulse crops, local wheats, fodders and grasses. The Cotton Botanist and his staff are principally engaged in the breeding work related to this crop, but in addition are interested in the millets, in particular *juar*. This officer also controls the main cotton farm at Akola.

The Deputy Directors of Agriculture are in the first place concerned with the work in progress on their experimental farms, the testing of varieties of improved strains of seed, of different manures and methods of cultivation and of implements. They are responsible for the reliability of the experiments and the correctness of the conclusions drawn therefrom. They have, in addition,

a very large amount of executive work and supervision concerned with the organisation and carrying out of the methods adopted to carry o the extension work in their circles, the development of pure seed supplies, improved technique and the expansion of the use of better implements.

At present each circle is divided into two sub-circles, each consisting of two or three districts. These are the charges of the Exrta-Assistant Directors. Their work is concerned with the extension, primarily the organisation of demonstration work in their circles. They are in charge of Government seed and demonstration farms. They co-operate with the district authorities in organising agricultural associations and attending their meetings, and with the co-operative movement in organising seed unions. They have to be sound, practical, tactful and helpful men. They are a valuable link between the expert and the farmer.

They are in turn helped by agricultural assistants. Some of these assistants are superintendents and overseers on Government farms: others work in the College. The majority are associated with extension work under the Extra-Assistant Directors, carrying out the scheme of work organised for each assistant's circle. At present, there are only about two men per district and an assistant's charge may include 400 to 500 villages. To facilitate work each assistant has two or more *kamdars*. This useful body, many of them extremely capable practical men in the restricted lines of work for which they have been trained on Government farms, are utilised partly in charge of demonstration plots and partly in carrying out at the assistant's direction practical demonstrations from village to village in new methods of cultivation or in the working and use of new implements.

87. *Methods of extension.*—The three great lines of improvement in agricultural extension are better seed, which implies purer seed and heavier yielding seed of better quality, better tillage methods, and better implements.

The discoveries of the laboratory and the breeding station, adapted to the needs of the cultivators on the experimental farm, are handed on to the grower partly by departmental efforts and partly by the use of private agencies. Those contributed by the department are as follows:—

(1) Agricultural shows at farms or fairs.
(2) Seed and demonstration farms.
(3) Establishment and management of seed stores and implement depôts.
(4) Demonstration plots for definite purposes.
(5) Smaller practical demonstrations from village to village, carried on by agricultural assistants and their *kamdars*. Such demonstrations may include (*a*) the growth of a new type of seed as against an existing type on a cultivator's plot, (*b*) the carrying out of some new form of agricultural practice, as the single plantation of paddy seedlings or line sowing in area given to broadcasting, (*c*) the use and handling of ploughs or the construction of a sugar boiling furnace and the like, (*d*) the treatment of seed. During the past year 2,384 practical demonstrations of this kind were given in the villages of this Province.
(6) The distribution of pamphlets, bulletins and the giving of lantern lectures. During the year as many as 4,743 bulletins were distributed or sold and 61 lectures given.

These methods are not however in themselves sufficient, either to extend use of pure seed and implements or to enable the department to get into touch with the bigger landowners.

88. *Seed agencies.*—With regard to the first, the seed grown on the Government farms does not go to the market nor is it sold to any buyer. It now goes out to a large body of certified *pure seed growing farmers* who in their turn multiply the seed and sell it to the grower. During the past year, there were no less than 2,473 wheat seed farms, 931 paddy seed farms, 1,536 cotton seed farms, 280 *juar* grain and 956 ground-nut seed farms working in concert with the department in this extremely important type of work. In several cases in the north of the Province, tahsil and circle associations took an interest in providing seed to their members.

In the present year, the department is engaging in a big scheme, utilising a *taccavi* seed loan to the value of one lakh so as to finance these associations. The associations will get their seed from approved seed farmers to the amount of the loan taken up on joint security. They will lend out the seed to the members of the association on 20 per cent interest, *i.e.*, on the

return of the lent seed stock and 20 per cent added at harvest. After harvest the associations will pay 10 per cent of the loan *plus* 10 per cent interest in kind to Government. The seed returned less that needed to pay interest will be lent on the same terms next year. It is hoped that after ten years, the associations will not only be able to repay the capital and be in possession of seed stock equal to the value of the original loan, but will have in addition reserve funds for other forms of agricultural improvement. Co-operative societies in the wheat tract also deal in seed. The pure seed owned by sixty-five societies forming one union was 600,000 lbs. this year, sufficient to sow an area of 6,000 acres.

Somewhat similar unions of seed farmers were at one time fairly common in the cotton tract. A central seed farm received its seed from the Government farm and grew it. After ginning, this seed was taken by a group of farmers round the central farm and sown next year on their land. The union seed was then ginned and went on to the general seed market. This sound organisation is however not as prevalent in the cotton tract as it used to be and, though single seed farms have increased, unions have tended to decline. The Co-operative Department works in close touch with the Agricultural Department in the organisation of these seed agencies and unions, many of which are registered under the Co-operative Societies Act and are under the financial guidance of the Registrar of Co-operative Societies.

89. *Agricultural associations.*—District, tahsil and circle agricultural associations are the chief means adopted for getting the bigger farmers interested in agricultural work and in securing their active co-operation. These associations vary very greatly in activity, some being very progressive, others almost moribund.

Originally they were formed by the rather haphazard selection of the bigger men without very close regard to their interest in agriculture. Experience has shown that associations of this kind to be successful (1) must consist of practical agriculturists, (2) should be associated with an area connected with one or two definite problems, (3) must lend itself to the technical guidance of the department. The district associations were first formed, then the tahsil. The circle associations are more recent. It has been found that on the whole, though a district association here and there may be active, tahsil associations are more effective than district ones and circle associations than tahsil. The tendency now is to develop the smaller unit, with the intention of building up the tahsil association by election or representatives from the circles and the district associations in like manner from the tahsil associations. This will take some time. Meanwhile, it must be acknowledged that very good work is done by many such associations. Seed expansion, as outlined above, is one, development of implement stores which is mostly in evidence in Berar is another; general interest in the work of the local demonstration farm, assistance in organising the programme of village demonstrations and active private use and demonstration of departmental suggestions in their own villages are others.

The time may be looked forward to when each agricultural association will have its own demonstration plot, as several have. On these will be shown by the agricultural assistant the improved methods to be introduced which the members will undertake to incorporate in their own activities. Such associations will get capital by selling seed, implements and manures and arranging for the marketing of members' crops.

An active development of such associations would go far to reduce the labour of the department and to hasten the spread of a better general standard of agriculture. Recent reports go to show that a much wider interest is being taken in the activities of the department with each successive year. There is a very wide gulf fixed between the conditions in 1906 and those of 1926.

CHAPTER XII.—Research and Investigation.

90. *Botanical research.*—The early work of the section was necessarily of a preliminary character. A considerable amount of valuable systematic work was done and a herbarium started which now contains over 3,000 specimens. Careful botanical studies were made of the rices and *juars* of the Province.

With the opening of the laboratories in 1915, a more active advance became possible with regard to economic research. Several rices were issued after selection. A certain amount of attention was given to cotton as regards quality, length and strength of staple, but it was not till 1921 that the botanical section took over this work seriously. The early attempts to improve local

cottons were controlled by the Deputy Director of Agriculture of the southern circle. The pollinisation and cross fertilisation of *juars* received attention. During the War, the Botanist went on service and work passed from an active to a more or less dormant condition, though selection was continued in various species and gram in particular was improved. At the close of the War, plant breeding work again became active. Ground-nut, *juar* and cotton received increased attention. In both the former valuable strains have been isolated. In November 1923, the Botanist, assisted by the funds of the Indian Central Cotton Committee, began to concentrate very closely on cotton and since that date much valuable work has been done on this crop. Strains of local types have been isolated which are high yielding, good in staple and wilt resistant, and have been grown this year on a field scale with most promising results. Hybridisation has been active. Several long staple strains of promise are fixed. A second Botanist was appointed in 1925. He has taken over the organisation of the teaching work and the research work relating to the breeding of local wheats and the pulse crops and will investigate the fodder and grass problems of the Province.

91. *Roseum cotton.*—In addition to the plant improvement work under the botanical staff, a great deal of variety testing and selection and hybridisation has been carried on by Deputy Directors on their experimental farms and most of the improved crops now in general use have come from work of this kind. The investigation of cotton was taken up by Dr. Clouston shortly after his arrival in India and the common mixture of cottons known as *jari* was isolated into the six common types prevalent. The testing of these resulted in the separation of *roseum*, which today provides the seed for half a million and more acres in the cotton tract. Roseum may be the subject of much hostile criticism at the present day, but the fact remains that it is still the most paying cotton which the cultivator, whose land is free of wilt, can grow and its introduction has during the last 15 years brought many crores of increased profit to the grower.

Today a cotton of finer quality which will pay the grower is required. During the War, the Indian mills began to concentrate to a greater extent on better quality. But at this period the department had no botanist and hybridisation requires very close and expert personal attention. The close research work going on today should have come into being some ten years ago and would have but for the breakdown caused by the War. The defect is being made good and when staple, as compared with ginning percentage, comes into its own, types to meet it will be there. *Roseum*, having right well served its day and generation, may then be replaced.

92. *Improvement of juar, paddy and wheat.*—Another of these earlier samples of selection is found in *juars*, two varieties of which, selected very early in the history of the department, still stand out as the best in common use on the fields of the many cultivators to whom they have been introduced.

Paddy has been improved and the chief varieties issued by the department and grown on its seed farms, originate from farm tests and selections. Wheat, particularly that of the north of the Province and the plateau, is indebted for the new varieties, some selections from local wheats, or imported mixtures, and some the outcome of hybridisation, which now cover thousands of acres in these areas, to the breeding work at Powarkhera. At Adhartal, wheat breeding of intensive character is going on. Rust resistant and higher yielding types of even better quality have been bred which in their turn will one day replace those which now hold the field.

93. *Sugarcane.*—Sugarcane is another example of a crop which has been improved almost entirely by work on Government farms. In this case it has been case of testing varieties from different areas from outside the Central Provinces. As a result the department has been, for some years past, offering distinctly better yielding types of thin and thick canes. Of late years, the products of the Coimbatore Breeding Station have been under close comparative tests on different farms in the Province and there is no doubt that the present varieties in no short time will give way entirely to these new products of careful scientific work.

94. *General progress.*—It may be said that, perhaps with the exception of the lesser millets and some of the lesser grown oil-seeds and pulses, the department is in a position at the present day to provide the grower with higher yielding and higher quality and better suited varieties of nearly every crop commonly grown.

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98. *Engineering and machinery improvement.*—When the large areas growing similar crops and owned by many small holders are considered, the difficulty of effectively putting into practice methods applicable to staple crops can be realised. At the present time it is a question of collecting data rather than a matter of effecting immediate improvement. This takes two forms:—

(*a*) the purchase and trial of existing implements and machinery and the testing of their suitability to local soils and economic needs;

(*b*) the designing of implements based on either western or Indian models. The aim in the former type is simplification without sacrifice of efficiency and in the latter improvement of the local implement.

In the early stages of development the first of these received a great deal of attention on Government farms. It is still carried out but possibly more with the expectation of adaptation than of direct introduction.

Designing and simplification for local manufacture and use were also taken up in the earlier days of development but have been much more to the front since the appointment of an Agricultural Engineer on the staff in 1920. In the earlier stages, ploughs were the implements which received the most attention. As a result of these direct trials, in some instances assisted by alterations incorporated into models by the makers after consultation with local officers, it has been possible to lay down for different soil conditions and economic requirements the correct type of plough for the varying local needs. Thus the cotton, wheat and rice tracts have each their specific type or types of plough suitable for the conditions of each area. Two other problems which received early attention on Government farms were hoeing and winnowing, for both of which implements were designed, which have been in steadily increasing demand for many years and are both manufactured locally for their respective markets.

Several other simpler machines adapted or designed by the Agricultural Engineer are in use and are being made either at his shops or by Indian manufacturing firms to his designs.

99. *Problem of improving implements.*—Implement improvement is not by any means a simple matter. Very few of the implements or machines to be seen today on a western show yard are of much use to the Indian farmer as they stand. The greatest problem is the small cultivator. Apart from the need for low first cost, simplicity and strength in the tool advocated, it must be remembered that, even if he can secure the capital, the area of his farm reduces the effective duty of an implement and thus handicaps its economic introduction. He is accustomed to a general purpose implement. Most of western tillage machinery is specialised and on this account, even if capable of easier and better work, is less adapted to his limited needs. The smaller cultivator is restricted to implements which cost little and of which the primary function is the direct improvement of the outturn of saleable material. On the farms of bigger men, labour and time saving machinery is growing in importance, for here the implements designed to suit western conditions have a greater chance. But in these cases though a certain degree of specialisation might have its advantages, greater simplicity of design than that common in modern implements is still essential, as neither they nor their labour have been brought up to understand the working of and care needed by modern machinery. Modern aids to easier handling, which are the chief feature of the later models, tend to raise the cost and to increase the chance of damage. Neither at the present juncture is suited to Indian conditions. The rapid increase in the sale of ploughs during the last four or five years is the outcome of, among other factors, the manufacture in India of simple models, built on western lines including the main essentials rather than the later additions. These Provinces have a considerable number of bigger farmers and landlords, the size of whose farms permits the employment of implements and machines suited to enterprise on a large scale. The fact that there are 26 tractor outfits owned privately indicates this. The department has had both classes of demand in view. Though simplification and improvement will continue, experimental work, ranging from investigation into tractors and their outfits and oil-engines and their stationary plants to the simplest of ploughs and hand tools, has provided the department with the means of supplying immediate needs and the wherewithal to advise and offer implements suited to such needs as may arise. The department, as a result of such investigation, has met the immediate demand for ploughs of various types, hoes, simple cultivating implements, fodder-cutters, winnowers, cane-mills, sugar boiling furnaces, simple threshing implements, oil-engines, water lifts of different patterns

and tractor outfits. It is also in a position to supply when the demand arises, such implements as automatic seed drills, small power threshers, reaping machines and larger scale tillage implements.

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CHAPTER XIII.—Extension.

107. *Utilisation of the department's work by the cultivator.*—This is seen in one of three forms—

(*a*) the inclusion of results arrived at on experimental farms in local agricultural practice and changes in technique which have been or are being effectively introduced;

(*b*) the expansion of the areas under improved strains and new crops;

(*c*) the expansion of the use of more effective implements and machines.

108. *Changes in technique.*—Improvements in technique are brought home to the cultivator partly by observation of the work in progress on a seed and demonstration farm but chiefly by the aid of the small demonstration plots, opened to emphasise and illustrate new processes, and by actual demonstration by assistants and *kamdars* in the villages. Over 2,400 such demonstrations were given during the past year.

(*a*) *Tillage.*—Better cultivation in all tracts has followed on the extension of the use of the inversion plough. In the cotton and wheat tract, its value in cleaning the land and in the removal of the deeper rooted weeds is widely recognised and comparatively small men come forward to hire the use of a tractor for this purpose when unable to do the work with their own bullocks. Ploughing in Berar a dozen years ago was a matter of rare occurrence. At the present day it may be said to be almost becoming general.

(*b*) *Planting.*—One of the earliest improvement in cultivation which was demonstrated in the more backward rice tract was the transplanting instead of the broadcasting of rice, and its subsequent cross ploughing termed *biasi*. The campaign was opened in 1906-07 when 20 acres were thus planted. By very steady efforts the area was by 1918-19 extended to 41,824 acres in Chhattisgarh. The area so treated in this part of the rice tract has, however, decreased since that date to a little over half the figure. The process was proved to be paying, but it had to contend with certain economic conditions, the chief being the extreme sub-division of the majority of the holdings, the general low pressure of population and low standard of living and the fact that the labour demanded for transplanting upset the even distribution of work over the other crops. At the present day, transplantation in this area is to be found in those places where population is denser and there is a greater tendency to consolidation.

In connection with this process of transplantation, the department advocated the use of single or double seedlings instead of bunches of 8 to 10 seedlings. In the Wainganga area of the rice tract, where the pressure of population is higher, transplantation as opposed to broadcasting has been common for many years, but was done in bunches. In this area, the use of single seedlings with its attendant saving of 60 lbs. seed per acre and its higher outturn is rapidly replacing the old bunch method. It will not be many years before the old method of planting is entirely superseded. In the north where labour difficulties check transplantation, the drilling of seed is being introduced.

Another direction of improvement is seen in the north of the Province. Up to a few years ago it was the almost universal practice to broadcast the seed of all crops (such as cotton and *juar*) sown during the monsoon. Demonstrations in line sowing, using the country drills of the south of the Province, have been most effective and a very wide area is now sown by drill. With the use of the drill has followed the introduction of hoeing with bullock hoes.

(*c*) *Plant protection.*—Smut in *juar* is an essential cause of loss. The use of copper sulphate and later of copper carbonate as a preventative has been widely demonstrated and considerable quantities of this seed are now treated before sowing. Between 12,000 to 15,000 acres are estimated to have been protected by copper salts distributed in the past year.

(*d*) *Sugarcane.*—Sugarcane is a crop which has received a good deal of attention. Formerly it was often sown in flat beds, frequently by trampling in

the whole cane. It was generally treated in a very extensive fashion. Demonstration has resulted in almost all the cane being nowadays sown in ridges and furrows and in the use of setts and, where setts were formerly used, the number of these used has been largely reduced. Cane in the past suffered from lack of manure. The department has obtained effective recognition of the value of the growth of *sann* hemp as a preparatory green manure crop and has in other parts succeeded in causing an extensive use of cake or cake with ammonium sulphate, as a substitute for, or an addition to, a limited cattle-dung supply. Associated with this crop may be mentioned the marked economy effected in the boiling of the juice by the wide introduction of a simple furnace, designed in this Province, which is very rapidly replacing the old country form. This furnace costs but Rs. 10 to construct but by its design the whole of the juice of an acre of cane can be boiled down without even the entire utilisation of its own megasse. As in the old type of furnace the grower required to spend something like Rs. 50 on wood fuel per acre of cane, because the whole of his megasse was insufficient, the popularity of the new furnace is easily understood.

109. *Introduction of new crops and pure varieties of seed.*—This is the direction in which improvement has been the greatest, because it affects both rich and poor and is undoubtedly the easiest way of increasing farming profits as it demands but small capital outlay and does not clash with existing labour difficulty or other factors.

The fullest advantage of this improvement, however, cannot be taken without a corresponding rise in the standard of farming in that it is not possible to take off annually higher yields by growing more prolific strains without increasing the loss from the soil. Moreover, a higher quality and better strains demand a better standard of tillage and manuring to give the best results. Improved technique and improved implements are necessary, if the full value of new crops and, still more so, better types of existing crops, are to yield their full harvests.

110. *Seed multiplication.*—The organisation for seed multiplication has already been outlined. The seed is raised on the Government farms and thence, as a rule, passes out to selected seed farmers, whose crops are visited by departmental officers or assistants during the year. Seed distribution from Government farms on any scale began during the years 1912 to 1915 in the different circles. The methods adopted to increase this supply vary. With some seeds, as, for example, cotton, the supply is at certain centres taken up by unions of growers situated in the neighbourhood of a primary private seed farm. In others, it is bought up by seed stores and sold to growers the following year. Another agency is the agricultural associations who, on receiving seed from a seed farm, issue this stock to their members, thus placing a much larger area under the improved staple.

Again, many seed farmers are big men and, following the usual custom of the grain business, lend a fair proportion of their seed to their tenants. Another agency exists in the Northern and Eastern Circles in the form of village unions. There are small village societies of cultivators. Here the ordinary village mixture has been or is being gradually replaced by better staples given by the department in exchange for contributions of ordinary seed stocks brought in by members of the unions.

111. *Difficulty of maintaining pure seed.*—The chief difficulty in the way of establishing new varieties lies in maintaining the seed pure. Really effective departmental control ceases when the seed has been issued from the Government seed farm to the seed farmer. The district staff, though visiting these, can only advise the seed farmer to maintain the purity and can refuse to class a crop as sufficiently pure and suited for sale as such to the several secondary agencies mentioned. Cotton is particularly difficult to keep pure, as cross fertilisation and bullocks fed with mixed seeds from the ginneries tend to cause admixture in the field. The removal of the foreign plants may in extreme cases be an uneconomic proceeding for the grower and as such work demands attention and time, it is not infrequently shirked. Even when the crop is pure off the field, there is always a risk of mixture at the ginneries, unless the grower has his own ginning plant.

In the case of wheat and paddy, there is less danger apart from carelessness on the part of the grower at the time of threshing and this is as far as possible avoided by restriction to one variety on the farm.

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112. *Introduction of new types.*—Ground-nut is probably the most important new crop which owes its present position in the Province to the activities of the department. Though fifteen years ago it was practically unknown, yet today it is planted over at least 30,000 acres. It is in Berar a valuable rotational crop with cotton, replacing the less valuable pulses, and adds about Rs. 15 per acre to the net profits of the grower. It has replaced considerable areas of the lesser millets in the plateau tract and it is found in increasing amounts in the Northern and still more so the Eastern Circles where it adds from Rs. 15 to Rs. 30 to profits according to conditions. The spread of this crop would be much more general, were it not particularly susceptible to the ravages of the pig and the jackal. The presence of the former pest almost entirely stops advance in certain districts.

Another striking introduction was that of a variety of sesamum, introduced from Nagpur into the Northern Circle some years ago where it has almost replaced the inferior indigenous types and given an additional profit of Rs. 3 an acre.

The introduction of indigenous varieties of sugarcane has had the effect of driving out the older indigenous forms which were common twenty years ago and has materially contributed towards the rise in the acreage of cane from 18,000 acres, to which it had fallen, to the present 30,000 acres. The new canes add from Rs. 30 to Rs. 50 per acre to the value of the product.

113. *Improved varieties of ordinary staples.*—Of these, some are the products of selections from indigneous types, other selections from varieties of like species from elsewhere in India, while others again are the outcome of hybridisation.

With regard to the chief staples—cotton, wheat and rice—the figures shown below, which are taken from the last annual report, give some idea of the number of seed farms, the amount of seed which the department knows to have been distributed and the acreage growing pure or approximate pure new types. As for cotton, these last two figures are probably fairly correct, but for wheat and paddy, particularly the former, the figures of the acreage under improved seed is certainly very much below what it actually is, as the returns only refer to seed farm areas. As a very large proportion of the seed from these areas is utilised as seed through one or other of the secondary agencies already mentioned, the actual acreage under improved seed is probably three to four times the amount definitely known to the department.

——	Wheat.	Rice.	Cotton.	Juar.	Ground-nut.	Other crops.	Total.
Number of private seed farms.	2,473	931	1,536	280	956	492	6,668
Quantity of seed distributed (in maunds).	70,008	45,123	51,240	3,763	12,944	...	183,086
Approximate area in acres sown with improved seed.	125,138	108,057	514,904	65,080	28,691	2,554	844,424

As an indication of the probable accuracy of these estimates, it may be noted that, in the wheat tract, the sample now being offered in the principal markets is about 90 per cent pure compared with 60 to 65 per cent pure ten years ago. Again, a cross wheat issued to the public only three years ago is in such great demand that it has already acquired a trade name which means that it is coming into the markets in sufficient quantities for commercial purposes and separate shipment. It may be safely stated that the actual area under improved wheats in the Northern Circle and plateau, where the greatest concentration on the crop has taken place, is nearer 400,000 acres and that of paddy in the Province is about 250,000 acres.

114. *Profits for types recommended.*—*Roseum* is the principal cotton still grown on the Government seed farms of the cotton tract and on its associated private seed farms. In comparison with the ordinary *jari* mixtures, it brings to the grower an extra profit of from Rs. 7 to Rs. 10 per acre.

Of wheat the department has several types in distribution and growth. Five in common use are direct local selections, four are cross-breds in which yield and rust resistance are the chief characteristics and one has been derived from Pusa. The increased value to the grower of these wheats over the ordinary types is not less than Rs. 5 per acre.

The chief varieties of paddy recommended by the department have for the most part been derived by plant to plant selection from among the best provincial paddies. The increase in yield in paddy by the use of improved seed is about 14 per cent and the grower benefits to about the same extent per acre as in wheat. Seed improvement has undoubtedly added very considerably to the potential wealth of the cultivator. The total value exceeds by many times the total annual cost of the Agricultural Department to Government. Indeed the total net cost of the department for ten years is certainly less than half the gross additional profit which better seed has made possible.

115. *Implement extension.*—The rate of expansion of the use of improved implements has been remarkably rapid since 1920. It would have been greater but for the increase in cost. The expansion has been greatest in ploughs. One of the reasons for this lies in the fact that they are being made in considerable quantities by Indian firms and are put on the market at 80 to 100 per cent less than imported ploughs at a cost closely equivalent to that of the pre-war imported plough.

The following figures illustrate the expansion of this line of development:—

	Average annual sale of implements and spare parts.
	No.
1906—10	352
1912—17	2,100
1922—26	10,014

The principal implements in demand during the last season were—

Number of implements and parts of implements sold.

Ploughs.	Cane mills.	Fodder-cutters.	Akola hoes.	Other implements.	Spare parts.	Total number.
4,274	199	31	678	396	4,456	10,034

These figures refer only to sales from farm and association depôts. In addition, several firms have agents in Nagpur and make direct sales to the public.

116. *Agency for supply of implements.*—The original agency, and still one of the principal ones, is the implement depôt on Government farms. Originally there were two. At the present day each experimental and seed farm has its depôt. The working capital involved is Rs. 80,000. Agricultural associations, however, particularly in Berar, have begun to take up the sale and distribution of implements which are in demand. This activity is one of the factors which counts towards the larger number shown as sold in this circle. There are at present 37 shops financed by share capital provided by these agricultural associations in the Western Circle. The total capital thus invested is over Rs. 65,000.

The principle of getting tahsil associations to stock implements is being extended in other areas and will shortly be general in the wheat tract. The popularisation of implements is largely the outcome of village to village demonstration, and is also assisted by organised ploughing matches. In the Western Circle, increasing activity is shown by the large business done by associations in the hiring out of ploughs to smaller men who are unable to buy or whose acreage is too small to permit of economic ownership. During the past year, a thousand ploughs were let out on hire in the Western Circle. Assuming ten acres of work per plough, a reasonable estimate, one finds that 10,000 acres, which would otherwise not have been worked, have been ploughed.

117. *Types of implements sold.*—Ploughs of different kinds are the chief implements sold at present. Sugarcane mills are another type which have established themselves on their merits. The three-roller iron mills extract about 20

per cent more juice than the older country mills which at the present day are rapidly becoming extinct. A sugar mill pays its cost within a couple of years. Three-lined bullock hoes are in steadily increasing demand in the monsoon sown crop areas.

In the wheat tract, winnowers are now so well known as to scarcely need demonstration. A simple aid to the threshing of the crop which reduces the cost on the threshing floor considerably, the "Olpad thresher" is selling in increased numbers.

In addition to agricultural implements there has been a marked change, in the last fifteen years with regard to the utilisation of power plants, whether oil-engines or tractors. As stationary engines, they have been utilised in working small ginning plants and for lifting water. Tractors were first introduced on the College farm in 1919. There are now thirty privately owned and operating in general cultivation. Most of these outfits have been secured on *taccavi* loans.

CHAPTER XIV.—Cattle Improvement.

118. *The need for improved livestock.*—The improvement of cattle must continue to be one of the chief aims of agricultural research, as, for all time, they are likely to be the only important source of agricultural power. The number of cattle in the Province as compared with acres under cultivation was—

	Plough cattle.	Acres cultivated.
In 1908-09 ...	4,709,000	28,052,000
In 1924-25 ...	4,425,000	28,114,000

These figures for plough cattle are not entirely reliable, as they include, at any rate in the rice tracts, a large number of entirely worthless stock but are sufficient to illustrate the dependence of the country on the bullock.

It will be noted that the area to be cultivated has risen to a greater extent than the power available. It must also be realised that improvement in tillage processes, such as the extension of the use of inversion ploughs, call for more power than did the older forms of tillage. The expansion of better cultivation is thus dependent on, if not more working animals, at any rate better ones.

The very general complaint of the deterioration in work stock is probably justified. Except in one or two areas, there has never been anything related to breeding. The deterioration is attributed by some to a reduction of the grazing lands owing to expanding cultivation but this is only true in a very small degree. At the present time, the best stock is found where grazing is least and the worst where there is most of it.

119. *Distribution per cultivated acre in different tracts.*—The following approximates to the acreage dealt with per pair in different tracts:—

Berar 20, Nerbudda 11, Vindhyns 9.
Rice tracts 4 to 5.

In the first named the cattle depend on field grown fodder, the stalks of the *juar* crop, which is stall-fed. Roughly about two acres of *juar* is grown per head of livestock in the cotton tracts. In the last they depend on grazing, assisted by rice straw. In the cotton tract the bullocks are bigger and better, and as compared with the wheat tract the work is lighter. This tract keeps little which is not of active use. On the other hand, in the rice tract free grazing and cheap grass has led to a custom of judging social position by the number of head owned rather than by their individual utility, with the result that the effects of poor environment and bad climatic conditions are intensified by the existence of herds out of all proportion to the amount of grass available or the needs of cultivation, if measured in capable, even if small, animals. In Chhattisgarh, the herds kept are an actual source of economic loss, instead of, as they might well be, village assets. Many villages with large herds actually buy a very considerable number of their plough cattle from outside the village. These herds exist chiefly as providers of fuel.

Apart from the need to improve stock by breeding, the need for an improvement in the feeding of the animal is obvious, as it is only by making the best use of resources in this that any effective or lasting value in breeding can be expected. Hence the problem is twofold, to improve the type of animal and to induce the cultivator to feed it better.

120. *Cattle-breeding—early developments.*—The first breeding operations in the Provinces began at Nagpur in 1901 with the establishment of a herd of Gaolao cattle. This was followed in 1905 by the opening of a cattle-breeding farm attached to the Government farm at Powarkhera (Northern Circle). The herd established was the Malvis from Central India. Subsequently three small herds of local animals were started in the rice and cotton tracts. The College Dairy herd was started in 1912. Dairying began at Telinkheri about the same time, but there was no real breeding for higher milk production till 1919, when the first steps to establish a pure herd of Sahiwal were taken. The early progress in cattle improvement was not striking. The herds were in charge of Deputy Directors already overburdened with the demands of big circles and unable to give that close attention which breeding work demands.

121. *Present day conditions.*—At the present day, there are nine cattle-breeding farms. In addition to these there are two dairy farms, both at Nagpur.

Prior to 1923, each Deputy Director was in charge of the cattle-breeding farms in his own circle and these farms with one exception were attached to either a seed and demonstration or an experimental farm. These farms carried breeding herds varying from 60 to 100 head of cows; the breeding herd was kept with the object of producing pure bred bulls of the chief breed in the district.

From 1923 a whole-time officer was put in charge of cattle-breeding operations; and at present two farms are under his direct control. The other farms he visits twice or thrice a year for the purposes of classification of cattle; he advises the Deputy Director of Agriculture as to which animals should be sold off and as to scales of feeding, etc. In nearly every case it has been found that the herds maintained on these farms were far too large for the grazing area available and the allotments for maintenance. Many of the cows were suffering from old age and inbreeding, owing to the impossibility, in certain cases, of getting a change of blood by purchasing pure bred bulls in districts where nearly all the cattle were very mixed.

With the exception of the three cattle-breeding farms in the Eastern Circle and one in the Northern Circle (at which pure bred Malvis are reared), all the cows on the other cattle-breeding farms have been crossed with Sahiwal bulls with the intention of further grading. All herds have been reduced to not more than 30 breeding cows and no cow is kept over the age of ten years.

122. *The Garhi farm.*—Garhi is the only one cattle-breeding farm capable of carrying more than 30 head of breeding stock. This farm now carries 60 breeding cows of the Gaolao breed, the only really definite breed of value native to the Province, and this number can be increased to 80 in the near future but that will represent the maximum possible. The young bulls from this herd are pure bred Gaolao and are sold at the age of two and a half years. For animals of this breed there is a keen demand and they fetch an average price of Rs. 250 to Rs. 300 per head.

123. *The Telinkheri farm.*—On the dairy farm at Telinkheri there was in 1919 a herd of twenty-one cows of various breeds which gave a total of 14,000 lbs. of milk per annum. Since that date steps have been taken to create a herd of pure bred Sahiwal (Montgomery) cows, which now number twenty-six animals in milk and give a total of 60,000 lbs. per annum.

124. *Difficulties for the Eastern Circle.*—In the Eastern Circle the cattle-breeding problem is one of considerable difficulty. The climatic conditions are unfavourable, the country grows nothing but rice, the people are poor and the native cattle are small and for the most part of inferior quality. Here on the cattle-breeding farms the local Chhattisgarhi cow has been crossed with the Malvi. The resulting first cross was an improvement on the local cattle as regards size and bone, but the country is too poor to maintain a big animal such as would result from further use of Malvi blood and it is noticed that in the second generation these crosses if inbred are no bigger than the original Chhattisgarhi animal.

125. *Need for extension.*—The total number of breeding bulls of all kinds which the department can now issue from all its farms does not, on an average, exceed 40 per annum. This is not a sufficient number to make any appreciable progress in the near future; it is, moreover, highly undesirable to issue cross-bred bulls as at present produced at most stations, even though these are an improvement on the local animal.

The stage has not yet been reached of producing a dual purpose breed which will meet rural needs and which will breed true, although experiments in this direction are being continued. The use of the Sahiwal in grading up in the Western Circle farms, though likely to provide a better milking female, will probably not create the active powerful bullock demanded by the local needs of this tract.

126. *Extension scheme proposed.*—To meet this need for extension, a scheme is under consideration for the transference or extension of the present breeding farms to larger areas, for the provision of two forest areas which will support a large size herd of selected local cows to be graded up by the use of pure bred bulls, and for the conversion of the present small area farms into local sale depôts. Concentration on a special breed is proposed in each area. In addition the pure bred herd of Sahiwal will be developed at the Telinkheri Diary farm and will provide bulls for use in urban and semi-urban areas in the improvement of the milk supply. The small herds, at Adhartal in the north and at the College Dairy farm, where experiments, at the first named in crossing the Malvi and Sahiwal and at the latter in blending Ayrshire with Indian blood are in progress, will be continued, as at each place an attempt is being made to create dual purpose breeds suited to local needs.

The development of this scheme is dependent on obtaining forest areas which should be a matter of no difficulty and on a more liberal budget allotment for cattle-breeding than now exists. Till the stock on the proposed large scale grade breeding areas reaches a sufficient standard of purity, the males will go on to the market as bullocks and the bulls from the pure bred herds will be utilised for meeting the demands of the existing premium bull scheme. When a condition of sufficient purity is reached in the grade herds, it will then be possible to concentrate on the improvement of the village cattle population, area by area, as is now done in the Punjab. When this stage is reached, it should be possible to put out 300 bulls per annum.

127. *The fodder problems.*—The fodder problem is almost more difficult than the breeding one. A number of possible fodder crops have been tried on Government farms but without very marked success except in the case of *berseem*, the use of which is restricted to irrigated areas, and some varieties of *sorghums*. Investigations are, however, still in progress. The use of fodder cutters in the *juar* growing tracts as a means of making a better use of these supplies has been advocated and their use is extending. Attempts are being made to encourage the preservation of monsoon fodders in the form of ensilage; but a good deal of work has yet to be done before this will be adopted. Practically all the straws of arable seed grown crops are consumed by stock. There is no waste in this respect. Though the growth of special fodder crops is advocated, economic conditions, such as the size of the holdings, absence of fence protection, the comparatively recent rise in the value of cattle and the belief in grazing tend to react against such means of stock betterment.

Experimental work has been started on the improvement of grass lands but they still are in their infancy. It has been proved that even spear grass, if taken early enough, provides quite a good hay. The difficulty, however, in cutting this and other grasses, at a time when their feeding value would be best, lies in the fact that this season coincides with that in which there is the greatest demand for labour on arable land.

The cattle of villages near the forests and those owned by large malguzars or professional breeders and *ghi* sellers largely rely on forest grazing. In some areas, the villagers cut and stack their grass. But, except in a few districts, the forests are not scattered about in blocks among the cultivated areas and this makes cutting, storing and carting difficult.

128. *Suggestions for improvement.*—The only general means in the future of increasing the fodder supplies are—

(1) the encouragement of stall feeding and the extension of heavy producing fodder like the *sorghums* into areas where they can be grown,
(2) the extension of irrigated fodders in the rice tracts, largely dependent on the facilities which the Irrigation Department can provide,
(3) development of the baling of hay, cut in forest areas, and its transport,
(4) in certain areas, a reduction of locally worthless animals which consume the limited supplies available.

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CHAPTER XVI.—Agricultural Education

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138. *Outlines of the degree course.*—The College degree course opens with agriculture, survey, mathematics and English. Agriculture deals in its early stages with elementary agriculture, geology and climatology, soils, the principles of tillage and manuring, the technical handling of the main farm crops from seedling to harvest, and a study of the simpler implements. Practical agriculture is directed to the above and extends to about ten hours per week. The first elements of chemistry and botany are introduced towards the end of the year.

In the second year, agriculture includes a detailed study of farm and garden crops, the elements of animal husbandry and dairying and farm accounts and further studies of machinery. The time given to mathematics and survey is slightly reduced and the time given to chemistry and botany increased.

The second year practical agriculture, apart from the time given to agricultural engineering, takes up about ten and a half hours per week in three periods. The class is in three sections which are engaged in turn on field crops, garden crops and irrigation work and animal husbandry. These students work a farm of their own of about 10—12 acres on which they grow the local field crops on commercial lines. Work is done co-operatively under the supervision of an assistant. The land, implements and bullocks are supplied by the Principal as landlord. The class undertakes to make certain returns of fodder crop and to carry out land improvement in lieu of rent. The area has a fixed cropping scheme, a predominant main crop supported by subsidiary crops. Cultivation records and accounts are kept by the class. The field work is done by them and they take the profits. In favourable years, as much as Rs. 470 have been received.

In the third and fourth years, mathematics and English are discontinued. Agriculture takes on a strong economic bias, with advanced studies in tillage, manuring, irrigation and animal husbandry and agricultural engineering. The time given to botany and chemistry is maintained and veterinary science and entomology are introduced. Practical agriculture, though keeping a student in touch with technique, is directed chiefly to management. In addition, the third year is trained in field experimental work and the students of the fourth year are each allotted a simple subject for investigation on which they produce a thesis at the end of the year.

The two-year course, neglecting direct science, as such, with the exception of a short course on farm pests, follows, on the whole, lines of the first two years of degree course. The students take, in addition to the subjects mentioned in the first year of this course, first aid and practical carpentry and blacksmithy. They have more time for practical agriculture.

139. *Objects of the courses.*—These courses have been designed to meet the needs of three groups, who may rightly be expected to come to an Agricultural College:—

(1) the sons of landowners, whose chief function should be the control of their estate,
(2) would-be teachers, investigators or Government officials associated with the land,
(3) the two-year course—the sons of the better class cultivators whose earlier education has not attained to matriculation standard.

140. *The utilisation of training.*—The Agricultural Department recruits men for its upper subordinate service from the degree course men and for its lower subordinate from the two-year certificated men. In cases where advanced specialised study is necessary, graduates can and do proceed to Pusa or Bangalore for post-graduate work. Practically all the men employed in the department have been through the College. A number of men trained at this College are employed, under Government, in agricultural work in other parts of India. Others are private estate managers.

141. *Expectations from affiliation.*—The number who have gone back to manage their own land is not as great as could be wished, though they are by no means lacking. It is believed that affiliation to the University will tend to strengthen the number who take agriculture for this last purpose. The social status conferred by the degree of a University is greater than that attained by the

licentiate of an unattached college. Arts and law have not infrequently been taken by the sons of the bigger landowners on this account and several have preferred to go to Poona instead of the local Agricultural College for the same reason.

Though a number of good men have passed through this College in the last twenty years, the recruitment till recently has on the whole been from those who have just managed to pass a matriculation examination and the general level of mental attainment has been too low for the standard aimed at in the full degree (diploma) course. This it is hoped will be rectified by affiliation.

The University, in its turn, stands to gain by affiliation with a fully equipped and well staffed institution investigating and teaching a subject of primary importance to 80 per cent total population.

142. *Results.*—Since 1916 the certificate has been awarded both to the certificate class and to the men who were taking the diploma class on the results of the intermediate examination at the end of the second year. Only the men who attained a first class certificate standard were permitted to take the last part of the diploma course. An average of eight men attained this each year. The average number qualifying for the certificate is eighteen and for the diploma is five.

The College is strictly residential. The Hostel is capable of holding 115 students and is at present full. In the selection of candidates, relationship to agriculture, educational qualifications and physical ability are considered on deciding admittance. Students whose field work and industry are unsatisfactory are not kept. The College and Hostel are well placed in regard to the farm, gardens, veterinary hospital and laboratories. It is well equipped in all sections at the present day.

The College gives practical short courses in animal husbandry and dairying, at which several men have been trained and the agricultural engineering section holds short practical courses in oil-engines and tractor management.

143. *Rural education—General policy.*—Since 1917, when the Government of India emphasised the necessity for affording increased facilities for vocational training the subject of agricultural education has been constantly under discussion.

Generally speaking, the educational policy of Government has supported every attempt to bring primary education more in harmony with rural surroundings and to give it a rural bias, but it has not been found practicable to embark upon any general course of direct agricultural instruction. In 1918, a liaison officer from the Agriculture Department was appointed to assist the Education Department in the adaptation of text books to rural needs and the development of nature study and to organise agricultural vocation classes for teachers. Experiments in individual schools, by local bodies or individuals, in the direction of direct agricultural training, especially in the neighbourhood of Government farms, where the farm staff could be utilised, have been welcomed. This policy has been supported by the opinion of the Curricula Committee appointed in 1921, which definitely advised against specialised vocational training in ordinary schools, and of the Vocational Training Committee appointed in 1922 which expressed the same opinion, but considered that agriculture might be introduced experimentally as an alternative to hand work into rural middle schools.

144. *Experiments in direct agricultural instruction.*—Certain attempts have, however, been made to meet the demand that definite agricultural instruction should be imparted in rural schools. The most important of these was the opening of two schools in the year 1918-19, one in the wheat tract and the other in the rice tract. These schools were originally designed with the idea of taking, from the upper standards of the middle school, sons of cultivators, who under normal conditions would, on leaving the middle school, return to their land and of giving them a finishing education largely agricultural but including some general education on lines applicable to their profession. Teachers were secured from the Education Department and were speically trained at the Agricultural College. They were helped by agricultural assistants attached to the farms. At first there seemed to be a future for these schools and as the result of propaganda a certain number of rural boys came forward but attendance soon fell away and interest declined. The school in the rice tract is now closed. Its establishment in a backward tract was probably a mistake, in that the people among whom it was placed had yet to learn the advantages of better methods. The school in the wheat tract has been gradually changed from a vocational to a pre-vocational school and is now, to all intents, a vernacular middle school,

taking boys from the fifth to eighth standards, and providing a course which replaces elementary science, drawing and history by agriculture and survey and gives the boys two hours per morning on the farm. In this form it shows signs of proving popular among the better class cultivators and landowners of its locality.

The objection to the older form was that the school led nowhere. Sons of the better class agriculturists could not pass on to higher education of any kind, while those whose sons were destined to return to their father's land had yet to learn that their boys gained anything of value from such a school. In its present form, the restriction on advance is removed and the boy continues to live among rural surroundings.

Another type has been an attempt to start purely agricultural classes for the cultivator's sons whose general elementary education was over. The first effort was made in 1922 at the Akola farm in the cotton tract, generally the most advanced in the Provinces, and the class was intended to cater for the needs of Berar. A few students turned up but there was but little enthusiasm and after a year it was discontinued. The defects lay in the fact that the farm selected, though the main farm in the tract, is of really a specialist type and was not under the officer directly responsible for the class. Again, the boys came from too great a distance. The experience gained as a result of the malguzari class had not been utilised.

Similar seasonal agricultural classes to be held on the local seed and demonstration farms of two other districts in Berar are under consideration and in one of these particularly, there has been an active demand for such training.

Another type has taken the form of short courses of practical work on Government farms, usually to train cultivators or servants of big landlords, on special lines of work, such as transplanting and the like.

The last type tried has been an attempt to give the pupils of an ordinary rural vernacular middle school three or four hours a week in practical agriculture on a departmental demonstration plot near the school. This simple form is about to be extended, where possible, in co-operation with the Educational Department.

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Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) That the money available in the Provinces is insufficient to meet the full requirements of agricultural research may be considered an established fact. Such being the case, the funds which Provincial Governments can devote to this beneficent, but not always obviously remunerative, work need to be supplemented from outside sources. At the same time it must be recognised that Agriculture is a Transferred subject for the development of which each Province is responsible to itself and assistance from a source outside the Province should be given in such a manner that this responsibility is unimpaired.

I suggest that the formation of a central fund or funds is essential and the success which has followed the work of the Indian Central Cotton Committee leads to the conclusion that similar plans could be adopted for other main crops. This fund could be provided by a cess on the exports of wheat, rice, oil-seeds and cakes, hides, bones, etc., and also on such quantities of these articles as are supplied to mills in India for local consumption. From the Annual Statement of the Sea-borne Trade of British India with the British Empire and Foreign Countries for the fiscal year ending 31st March 1925, the following figures of exports are taken:—

Wheat.	Rice.	Oil-seeds.	Hides.	Bones.
Tons.	Tons.	Tons.	Tons.	Tons.
1,289,315	2,200,973	1,328,456	55,588	68,279

Even fixing the cess at such a moderate rate as eight annas per ton the total sum which would accrue amounts roughly to wheat Rs. 6,45,000, rice Rs. 11,00,000, oil-seeds Rs. 6,46,000, hides Rs. 27,800 and bones Rs. 34,000. A higher rate could be charged for hides and bones and a lower for crops which give only a relatively small weight of produce per acre. The figures given above only form a rough guide to the amount of money which might be available and would need careful moderation and adaptation to the various crops. The low rate proposed would have only a very small effect on the profits of the actual cultivator.

For the administration of the fund, I propose that a number of sub or crop committees should be formed dealing with the main crops such as wheat, rice, oil-seeds, fibres and also with animal husbandry. These committees should be composed of representatives of the growers, the trade and agricultural officers, each under its own president, thus following the organisation of the Indian Central Cotton Committee but the individual committees might be smaller in number than the present cotton committee. Each Province growing a sufficient area of a particular crop to make it one of the main agricultural interests of the Province should be represented on the crop committees. The total fund to be allotted to research might be controlled by a Research Fund Committee under the Government of India and composed of the presidents of each sub or crop committee with an officer appointed by the Government of India as President and such other members as the Government of India might appoint. The animal husbandry committee would have the same status as the crop committees.

The President of each sub-committee would secure from the central fund a grant of money to be devoted to his particular subject, *i.e.*, wheat, cattle improvement, fibres, etc. The procedure to be adopted in allotting funds to various Provinces might be on the following broad lines. Any Province wishing to secure a grant of money from the central fund would submit a detailed scheme of the work it proposes to undertake. This scheme would be considered by the Research Fund Committee. On approval or modification of the scheme by this committee an allotment of funds could be made. Further, if from its knowledge of work being carried on in other Provinces, the Research Fund Committee considered that development should take place on similar lines in any Province then it could make a grant for the purpose to that Province providing that proper arrangements for the utilisation of such a grant were made. Under these proposals the Central or Research Fund Committee would have powers of control, scrutiny and allotment while the provincial authority would be responsible for carrying out the work. When once a grant had been made and subject to an annual progress report, a Province should be given free financial control over any grant allotted to it. The arrangements as at present

in force with the Indian Central Cotton Committee are too complicated and would be too time-absorbing for extension to the work of a number of other similar committees. If the staff employed in a Province were found insufficient to deal with the problems confronting it, then additional workers should be obtained and paid for from the grant made to the Province. As suitable men are not always easily obtainable, it might be desirable for a staff reserve to be maintained by the Government of India at Pusa or elsewhere but when once an officer has been sent to work in a Province, he should be under the entire control of the Director of Agriculture in that Province.

(ii) The provision for veterinary research in this Province in my opinion, is insufficient. At present accommodation is provided in the Agricultural Research Institute. Not only is this in itself very meagre but the rooms occupied by the Veterinary Department are badly needed by the Agricultural Department to allow for proper expansion.

A Provincial Veterinary Research Institute is, I consider, absolutely essential so that our efforts to improve the cattle of the Province may not be handicapped by present diseases which might be prevented or controlled.

(b) The Department of Agriculture in the Central Provinces should, I consider, have a special Statistical Officer and Economist added to its staff. He would deal with such subjects as co-operative marketing and general rural economics while at certain seasons he would be employed in analysing statistical data concerning the yields of agricultural produce, etc. The need for such an officer has frequently been expressed (*vide* Resolutions Nos. VI, VII and X of the Proceedings of the Board of Agriculture in India held on 21st January 1924). The status of the proposed Agricultural Economist should be similar to that of the officers at present in the Indian Agricultural Service.

In view of the recognised importance of agricultural bacteriology, the section of the department which deals with this subject should be expanded. At present, we have one assistant only, who is in the Provincial Agricultural Service and subordinate to the Agricultural Chemist. The work to be done is more than he can manage single handed. As the Mycological Section has been separated from the Botanical and an independent Imperial Service officer placed in charge, so I consider the importance of the Bacteriologist's work demands that he too should be able to develop his section on a wider basis with an increased staff and independently of the Chemical Section. The position of the Agricultural Bacteriologist in the department should be similar to that of the Mycologist and other sectional officers.

In this connection, reference may be made to Resolution No. I of the Proceedings of the Board of Agriculture held at Pusa on 1st December 1919 and Resolution No. II of the Proceedings of the Bangalore meeting held in January 1924.

(c) Research on the following subjects is not at present receiving as much attention as their importance demands :—

(i) Major crops such as oil-seeds, small millets and fibres. This would be taken in hand if the botanical staff were increased.

(ii) This department has no Soil Physicist. All teaching in the subject is given by one of the Lecturers in Agriculture at the Agricultural College.

(iii) The department had a trained Horticulturist until 1924 when his services were dispensed with. Since then the duties of the Horticulturist have been carried out by other officers of the department who have already plenty of work to employ their full time.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) Please see Chapter XVI of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 21—23 above).

This reply has reference only to the provision of technical instruction in agriculture.

The department has one college of University rank and a degree in agriculture is given after a course of study lasting about four years. It also provides a two-year course in the more practical side of agriculture for students who do not intend to proceed to the higher course. I consider this provision is ample at present and there is no difficulty with regard to the supply of teachers.

A farm with a school for providing instruction in practical agriculture is under construction in Berar and facilities have been offered for short courses of training on other Government farms. Full advantage has not always been taken of these facilities and even now some students sent to the Yeotmal farm for training in agriculture are under a bond to take up employment under the District Board, Yeotmal, as teachers in primary schools. This arrangement will not further the main idea of the course, *viz.*, to give a practical training to prospective farmers.

(ii) No. When the facilities at present available are utilised to their fullest extent we shall be prepared to extend them.

(iii) This is hardly a matter which affects the teaching of agriculture as a vocation, but as a general proposition I do not think it necessary to insist that teachers in rural areas should invariably be drawn from the agricultural classes. In a tract of country so pre-eminently agricultural as the Central Provinces and Berar, a large proportion of the teaching staff must inevitably be drawn from this source, but I doubt if this fact makes the teacher more efficient when, after training, he goes back to the rural areas.

(iv) Yes. The father does not appreciate the value of an agricultural training for his son. This is largely because, in so many cases, he himelf has had a very inferior education and cannot visualise the need for anything better. With the wider extension of general education, this obstacle will be gradually overcome.

(v) The prospect of obtaining some form of Government service has been the main inducement to youths to join any institution offering a training in agriculture whether it be a practical class on a farm or a college offering a fairly advanced course extending over some years. Very few have come with a desire to improve the agricultural practice on their own land. With an increasing appreciation of the benefits to be derived from a training in agriculture, the position is slowly changing. The affiliation of the Nagpur College to the University has been an accelerating factor in this direction.

(vi) Yes, as the agricultural classes predominate so largely in this Province. In selecting candidates for admission to the Agricultural College, the Principal endeavours to secure students who eventually will be in a position to put their training into practice on the land.

(vii) Not at present but when modifications are called for they are duly carried out.

(viii) (*a*) Nature study is of value in training the powers of observation when the subject is properly taught, but I do not think that it necessarily leads a boy to take an interest in agriculture. The enthusiasm, resourcefulness and capacity of the teacher are of the utmost importance. Nature study taught by close adherence to text-book is practically worthless.

(*b*) School plots have their value when they are worked on practical lines and the various operations of agriculture or horticulture carried out according to the methods followed by good farmers or gardeners. Here again everything depends upon the capability of the instructor. In suitable areas and where plots of land sufficiently adjacent to the school can be obtained, an extended experiment in rural education with the aid of the school plot should, I consider, be made.

(*c*) School farms are not of any value for young boys. Either the manual labour is too severe and the boys are too tired to give their best energies to the other subjects taught in the school or else the work has to be done by hired labour and the boy learns to watch instead of to work, a tendency already too prevalent.

In schools where agriculture is definitely taught as a vocation, the school farm is a necessity.

(ix) This information will be supplied by the Principal of the Agricultural College.

(x) Agriculture will be more attractive to middle class youths when it is made more profitable and when the general conditions of rural life become such that educated men can feel there is full scope for their energies and abilities outside the urban areas.

(xi) Temporary Assistants who have recently passed out of the Agricultural College are taken on the staff of the department and kept on a farm for a few years. These men may be absorbed into the departmental cadre, may take up private service, or may go back to their own land with an improved knowledge of practical agricultural problems.

MR. F. J. PLYMEN.

We have also a scheme for refresher courses to be given at headquarters by specialist officers but owing to paucity of staff this scheme has not yet been put into operation.

(xii) In so far as this refers to education in the principles and practice of agriculture, adult education can, I consider, best be popularised by improving the demonstration work carried out in rural areas by the staff of the Agricultural Department.

(xiii) I have no definite scheme to suggest as we are still experimenting along the lines already indicated in replies to previous sections of this question.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Please refer to the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar, particularly to paragraphs 86, 87, 88, 89 and Chapter XIII" (pages 9—11 and 14—18 above).

(*b*)The effectiveness of field demonstrations is closely correlated with the efficiency of the demonstrator or Agricultural Assistant. These officers vary very much in quality and I do not consider they have always been sufficiently enthusiastic to impress their teaching upon the public, nor do I think they have always been provided with sufficient facilities for the purpose. Their demonstrations have not invariably been made attractive enough and the visit of an Agricultural Assistant to a village has not been the event in village life which it should be. A certain amount has been done by providing lantern lectures but attractive travelling exhibits are necessary. In the neighbourhood of main roads, I should like to have demonstration motor lorries provided with the cinemas which could be used by all departments of Government dealing with the improvement of village life. Where roads do not permit of motor vehicles we should have to be content with taking exhibits around on a specially constructed cart. If an Agricultural Assistant had a really attractive 'show' to appeal to the eye as well as to the ear he would, I believe, easily command an attentive audience drawn from a considerable radius.

(*c*) The chief method whereby a cultivator can be induced to adopt expert advice in my opinion is the demonstration plot. This should show him how to farm to the best advantage an area approximating to the size of his own holding. Our ultimate aim should be to have such a plot within reasonable reach of every village. In some tracts of country such plots would have to be entirely financed by Government, in others Agricultural Associations or private individuals could run demonstration plots under the advice of officers of the Agricultural Department. The need for demonstration plots is fully realised by this department and we are gradually increasing the number.

QUESTION 4.—ADMINISTRATION.—(*a*) and (*b*) This question has been dealt with in the reply to question 1 (*a*). In my opinion, one of the best means to ensure the better co-ordination of the activities of the various Governments in India would be the financing, by the Central Government, of schemes to provide for work which, owing to scarcity of funds, any Provincial Government is unable to undertake for itself. I do not consider it would be feasible for a central organisation to attempt to co-ordinate work for the upkeep of which it was not financially responsible. Under the proposals made in reply to Question 1, the funds at the disposal of the Government of India might only be allotted where provision for co-ordination of work and co-operation in necessary directions had been secured.

There is also a need for a Bureau to summarise the work already done in the Provinces and to maintain such a summary in future years. This could be maintained by the Central Government.

In the case of All-India legislation on agricultural matters, it is doubtless desirable for the Government of India to have at its disposal some organisation to advise regarding such legislation.

(*c*) (ii) The present regulations regarding railway rates for the transport of agricultural produce, machinery and other requirements need to be closely examined. For example, sugarcane mills are not classed as agricultural implements and oil-cake is conveyed at different rates depending upon whether it is classified as manure or cattle food.

(*c*) (iv) The Agricultural Department would welcome any improved methods for the wider and more timely dissemination of weather forecasts. In this connection, the value of wireless telegraphy might be considered.

QUESTION 5.—FINANCE.—(*a*) Please see paragraph 51 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (page 8 above).

MR. F. J. PLYMEN.

It is desirable that the system of issuing *taccavi* in kind and not in cash should be extended as widely as possible, particularly to co-operative associations and for short-term loans. I do not favour the provision of much cheaper credit than can be obtained under the present system as this would only tend towards increased indebtedness and one of the present paramount needs of the cultivating classes is greater thrift.

(*b*) The system under which *taccavi* loans are issued should be both simple and speedy. With an increased demand for such loans, it may be necessary to appoint special *taccavi* officers to deal with the applications.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*), (*b*) and (*c*) Please refer to paragraphs 45 to 50 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 6 and 7 above).

There is considerable scope for giving assistance to the cultivator through such financing agencies as land mortgage banks. Legislation is also required on the lines of the Deccan Agriculturists' Relief Act. All these questions need to be taken up in detail by a whole-time officer who could specialise in the subject.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—This question has already been considered and notes* prepared on the subject by Mr. J. F. Dyer, Commissioner, Chhattisgarh Division. Please refer also to paragraph 6 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 1 and 2 above).

QUESTION 8.—IRRIGATION.—(*a*) (ii) Some development appears to be necessary in the northern part of the Province and the extension of irrigation from tanks is desirable. This will be dealt with in fuller detail by the Deputy Director of Agriculture, Northern Circle, in his written evidence.

(*a*) (iii) In some parts of this Province, particularly in Berar and the plateau districts, irrigation is largely done from wells. The supply of water from this source is of such importance that I consider the employment of a specialist to deal with the question is essential. He should investigate the whole subject of underground water and the conditions which govern its availability for irrigation purposes. This is particularly necessary in areas where the "Deccan Trap" is the prevailing geological formation as the occurrence of water in this rock is generally a very uncertain matter.

QUESTION 9.—SOILS.—(*a*) (i) Drainage has proved a satisfactory method of dealing with soils in areas where water-logging prevails at certain times of the year. Two methods have been followed—underground pipe drains and surface drains. The former is a somewhat expensive process and its adoption on an increased scale can only be expected by obtaining increased monetary returns from the crops grown on underdrained areas. Drains and other forms of land improvement can be financed by loans taken out under the Land Improvement Loans Act.

(*a*) (ii) Alkali (*Usar*) land is not of great importance in this Province as it only occurs in small patches. There is an area in Berar where the wells are distinctly saline and unsuited to irrigation. Injurious effects produced by using such waters for irrigation purposes can be overcome by giving the soil a rest from irrigated crops and allowing the rainfall of the monsoon to leach the injurious salts out of the soil.

(*a*) (iii) The system of *bunding*, *i.e.*, the erection of field embankments, is common in certain parts of this Province although the object is not always to prevent erosion of the surface soil but sometimes to ensure that a sufficient amount of moisture shall remain in the soil. Where water tends to flow from the fields of one cultivator to those of another it is very desirable that there should be co-operation amongst cultivators in order that the excess water should be removed without doing damage to the fields of any particular cultivator.

(*b*) (i) On some Government farms, the proper lay-out of the area, protection from erosion and in some cases, underdraining of wet fields, have resulted in considerable improvement in the area.

(*b*) (ii) *and* (*c*) Within recent times it may be said that a fairly large area of good wheat land has deteriorated owing to the growth of *kans* grass (*Saccharum spontaneum*). The Agricultural Department is meeting this difficulty by undertaking ploughing with bullock-drawn iron ploughs on contract and has recently secured a steam ploughing set for dealing with large areas.

*See pages 152-160.

QUESTION 10.—FERTILISERS.—(*a*) Greater use could undoubtedly be made of natural manures and artificial fertilisers. The department demonstrates the proper methods of preserving manures and utilising cattle urine as one of its main lines of work. In a general way it may be said that there is considerable scope for both natural and artificial manures on wet crops but not for artificial manures to be applied to staple crops in the dry season. The chief factor controlling any possible extension in the use of artificial fertilisers at present is the price. It is very important that the fertiliser trade should realise the all-importance of cheapness if the use of artificial manures is to make any headway. Every effort should be made to cut down overhead charges and the services of the Agricultural Department should be utilised to the fullest extent.

(*b*) The present trade in fertilisers in this Province being so small, no special measures are necessary to prevent fraudulent adulteration. The Department of Agriculture keeps a close watch on the fertilisers coming into the Province and samples are frequently subjected to analysis.

(*c*) Widespread demonstration and cheap rates are the two things necessary to popularise new fertilisers. Firms interested in the trade should be willing to supply such fertilisers for demonstration purposes either gratis or at very low rates. I would add that I have found the trade quite prepared to do so. I would also emphasise that the selling price fixed for manures on their first introduction into a Province should not be so low as to necessitate a big increase when the value of the manure has been demonstrated. Otherwise the confidence of the agriculturists would be lost.

(*d*) There has been a considerable increase in the use of manures at the following places:—

Karanja cake (*Pomgamia glabra*) for sugarcane in Betul and Jubbulpore.

Til cake (*Sesamum Indicum*) in the Southern and Eastern Circles.

Ammonium sulphate for cotton at Hoshangabad.

(*e*) Investigations up to the present have not been sufficient but that subject is one which is receiving constant attention on Government farms. A bulletin summarising results up to date has been published.

(*f*) Please see "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar", paragraph 67 (page 9 above). It is only by demonstrating the greater economic value of cowdung as a manure that the practice of using it as fuel can be discouraged.

QUESTION 11.—CROPS.—(*a*) (i) Please see paragraphs 90 to 94 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 11 and 12 above).

(*a*) (ii) *and* (iii) *and* (*c*) These subjects have been dealt with in paragraphs 109 to 114 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 15 to 17 above).

I consider it essential that any new crop which is recommended for a Province should be one which can be reproduced by seed or otherwise in that Province or at least in some other part of India. For example, *berseem* clover (*Trifolium Alexandrinum*) is undoubtedly a valuable fodder crop but as the seed has to be imported yearly from abroad, the extension of its cultivation in the Province is limited. The botanical staff of the department has recently taken up the study of fodder crops, including grasses, as one of its important lines of work.

(*a*) (iv) This is a subject which has received a considerable amount of attention as the damage done by wild animals, chiefly pig, in this Province is extensive. The extension of some valuable crops, *e.g.*, ground-nut and sugarcane, is hindered owing to the expense involved in fencing and watching. Economy can, however, be practised by concentrating the area under such crops and this has been carried out successfully in the Western Circle with regard to ground-nut.

In 1925 a scheme was formulated by this department for an organised attack on wild pig by the aid of professional *shikaris* but funds could not be provided and the scheme has been held in abeyance. This, however, is really a matter in which the cultivators should help themselves by organisation and co-operation. It has been done successfully as in three years as many as 27,000 pigs were killed in the north of the Province by organised beats, local cultivators paying a few annas for each pig killed.

QUESTION 12.—CULTIVATION.—(i) Reference is invited to Chapter XIII of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 14—18 above). The improvements which have taken place in this Province in previously existing systems of tillage have been in the introduction of iron ploughs, sowing in lines instead of broadcast and the introduction of more efficient implements for interculture. It may be noted that there are now about 27 privately owned tractors working in the Province.

(ii) Little can be said with regard to the present possibility of improving the customary rotations or mixtures of the more important crops except that in certain cases there is a tendency to overlook the necessity for a rotation in the desire to put a larger area under money crop. Ground-nut has proved a very useful rotation crop for cotton and *sann* promises to take a similar place in the agriculture of the plateau districts. The mixture of minor millets and *til* (*Sesamum Indicum*) which is grown in the Chhattisgarh should be capable of improvement but care must be taken in replacing such practices, as the growing of a mixed crop often takes the form of insurance against total loss of crop.

QUESTION 13.—CROP PROTECTION.—(i) This department has not had a great deal of experience in the working of the existing legislation for preventing the importation of dangerous plant diseases and pests as laid down in Government of India Notification No. 580-240, dated the 26th June 1922.

My personal opinion is that the procedure at present followed is not always efficient and takes too long. Recently a valuable consignment of plants was delayed for about 10 days in Bombay and on arrival at Nagpur they were practically all dead. On another occasion I have actually found live insects in a consignment of plants which presumably had been subjected to the system of disinfection followed under the regulations. The importation of new or improved varieties of plants is seriously handicapped by the present regulations and I consider local Departments of Agriculture should be given more power and responsibility. Anything imported by the Director of Agriculture should be delivered to that officer direct and he should be held responsible for seeing that no injurious plant disease or pest is thereby introduced into his Province. Exceptions are already made in the case of certain plants and I see no reason why this practice should not be extended.

(ii) It is desirable that the Agriculture Department should be able to specify dangerous plants such as lantana and water-hyacinth, the destruction of which should be made compulsory.

QUESTION 14.—IMPLEMENTS.—(*a*) Reference is invited to paragraphs 98, 99, 115, 116 and 117 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 13, 17 and 18 above).

The post of Agricultural Engineer should be considered one of the most important in an Agricultural Department. He should be an officer capable of appreciating agricultural requirements and of devising implements to meet the same.

(*b*) Increased and more efficient demonstration is the chief method by which the adoption of improved implements can be increased. It must further be stated that simplicity of construction, elimination of all non-essential parts, provision of spare parts, where necessary, and a supply at the lowest possible cost are the essentials which should receive the attention of implements makers. As in the case of fertilisers, implements should originally be put on the market at a price not greatly below that at which it is expected they will be sold in the future. Attractive prices, which cannot be maintained, may create a demand at first but will eventually lead to disappointment.

QUESTION 15.—VETERINARY.—(*a*) I do not think the Civil Veterinary Department should be under the Director of Agriculture but the two departments should work in close co-operation. The Civil Veterinary Department of this Province was removed from the control of the Director of Agriculture in the year 1921 and I do not consider this has resulted in weakening the co-operation between the two departments.

(*c*) I consider the staff of the Veterinary Department should be increased so that outbreaks of disease could be dealt with more promptly.

(*g*) A Provincial Veterinary Research Institute is a necessity in a Province so largely agricultural as the Central Provinces and Berar.

MR. F. J. PLYMEN.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Reference is invited to Chapter XIV of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 18—20 above).

Comprehensive proposals for improving the breeds of livestock in this Province have already been framed and copies are attached.* If these schemes can be put into effect, the department will have sufficient work in animal husbandry to occupy its attention for some years.

(ii) The betterment of the dairying industry is one of the greatest needs in this Province and a certain amount of progress may be possible on co-operative lines. The improvement of the milch animal must, however, precede any great advance in dairying.

(*b*) (i) This is bad everywhere. The following figures relating to the Central Provinces and Berar have been supplied by the Deputy Director of Agriculture in charge of Animal Husbandry:—

	Acres.
Land, exclusive of forest areas, classed as not available for cultivation and culturable waste other than fallow	19,500,000
Total number of cattle (*i.e.*, all classes of bulls, cows, buffaloes and their young stock) ...	11,800,000 or 1·6 acres per head of stock.

In addition to the above, the following is the forest area available for grazing in the Central Provinces and Berar:—

	Sq. miles.
Total forest area in the Central Provinces and Berar ...	19,700 including
Area thrown open for grazing to animals other than browsers	12,500 or 8,000,000 acres

The maximum grazing area available for cattle in the Central Provinces and Berar is thus 19½ million *plus* 8 million, *i.e.*, 27½ million acres or approximately 2.3 acres per head of the cattle population.

It must be remembered that the grazing is of exceedingly poor quality and the Deputy Director of Agriculture in charge of Animal Husbandry estimates that, on an average, about 5 acres per head would be required to keep an adult animal in fair condition or in other words these Provinces are at least 100 per cent overstocked.

The opening of additional forest areas for indiscriminate grazing offers no hope of solving the problem of insufficient fodder supply. On the other hand, it would only tend to aggravate the evil by providing still greater facilities for the breeding of inferior cattle on unscientific lines.

(ii) In my opinion, there has been a decided tendency in recent years to cut down the area left as a grass border in tilled fields in order to increase the area under money-producing crops.

(iii) In the tracts, where wheat or rice is the main crop, there is a sufficiency of straw for fodder. In the cotton country, partly owing to the increase in the area under cotton and in also years when the crop is poor, the supply of *juar* fodder is sometimes deficient.

(iv) There is a general absence of green fodder in dry seasons. This is due to the high temperature prevailing in the hot weather and also to the impossibility of growing any large area of fodder crop under irrigation.

(v) This is essentially a subject for research in a central institute with subsidiary investigation in the Provinces.

(*c*) Generally speaking, the fodder supply in the Central Provinces and Berar begins to deteriorate in February and March. In April and May, there is very little grazing at all and such as then exists is extremely poor. June and July are the most trying months. In a year of normal rainfall, stock begin to improve in August and remain in fairly good condition till the end of January.

(*d*) The system of keeping reserves of baled grass to meet famine or scarcity conditions might be extended. The grass would be cut and baled in forest areas but the price at which it could eventually be supplied to cultivators would depend upon the cost of transport and further improvements in rail and road communications.

*Not printed.

(*e*) The interest of a landlord in animal husbandry and in all farming operations will, I consider, increase when these operations can be made to give a bigger financial return and when agriculture as a profession is considered to be worthy of more attention from all points of view.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) Please refer to the independent answers supplied by Deputy Directors of Agriculture in this Province.

(*b*) and (*c*) The following subsidiary industries are worthy of attention:—

(i) Vegetable and fruit growing for home consumption or market purposes in favourable localities and where markets exist.
(ii) Poultry farming.
(iii) Rope-making, basket-making and similar manual occupations.

To encourage a greater interest in vegetable and fruit growing, the Horticultural Section of the department should be strengthened. We have no expert Horticulturist at present and in a Province where citrus cultivation is of considerable importance and the supply of vegetables distinctly poor, better arrangements for technical instruction in horticulture should be made. The establishment of a fruit garden is a non-paying proposition for the first few years and it might be desirable for Government to finance cultivators if they contemplate planting up of fruit orchards and while no returns from the latter can be expected. Better arrangements for marketing should be made and also for transport of fruit by rail. At one time the loss on fruits sent in baskets by rail was very heavy, but recently special provision has been made for watch and ward by the railway authorities.

Rope-making might easily become a subsidiary industry in areas where *sann* hemp is produced, but for this also special technical instruction must be provided. Poultry farming is an industry which does not make a general appeal and only certain castes and classes of the community will touch it. Useful information might be obtained by consideration of the reasons which led to the abandonment of poultry rearing at Pusa a few years ago.

Sericulture has been tried in this Province, but the results were not very promising. Lac culture is a useful subsidiary occupation and is being encouraged. More could still be done with a bigger staff of assistants on extension work.

(*d*) The establishment of industries connected in some degree with the preparation of agricultural produce for consumption, such as those given in the question under reply is, I think, a matter for private enterprise and there does not appear to me to be any great need for Government to take the initiative.

(*e*) There would be certain advantages if industrial concerns moved to rural areas. For example, the establishment of oil presses or rope-making factories would create local and probably better markets for produce obtained in the surrounding area. On the other hand, the establishment of such industrial organisations would almost surely lead to a higher wage rate in the locality and this would have considerable effect upon the wages which agriculturists would have to pay to their labourers.

(*f*) Yes. I consider such a study is essential before the improvement of any rural industry can be undertaken.

(*g*) I do not consider any measures are necessary at present to provide greater rural employment other than the improvement of the whole agricultural position of the country. In general, there is a scarcity of labour rather than an excess and employment in rural areas needs to be intensified on the land rather than extended in new directions.

(*h*) There is undoubtedly scope for the village population to devote themselves to the better lay-out of their village and to the improvement of the sanitary conditions of the same. Such efforts could be carried out under the advice and direction of the Public Health authorities. Before the need for such improvement is fully realised, the general standard of education in many parts of this Province will have to be raised and the spirit of co-operation for the public good inculcated.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) The seasonal movement of labour from areas where there is a surplus to others where a shortage prevails takes place spontaneously and no particular measures are necessary to encourage the same, other than a general improvement in communications. This seasonal migration is dealt with in detail in paragraphs 25 to 28 and 31 of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 3—5 above).

(*a*) (ii) Areas near Government forest which have been found suitable for cultivation have been excised and formed into ryotwari villages. This system might be extended should a demand for such land exist. The total area dealt with in this manner in the last twenty-five years has amounted to about 2,500 sq. miles.

(*b*) That there are seasons during which labour is in demand in certain areas is clear from the references given in reply to (*a*) above. This shortage of labour is really due to scarcity of adult population and can be ascribed to the following causes :—

(1) mortality amongst the young,
(2) inefficiency of the labourer, this being largely on account of disease.

The introduction of labour-saving machinery is one way by which the scarcity of labour can be overcome and his efficiency will be gradually enhanced by the provision of means for improving his health and education.

(*c*) This question is not applicable to the Central Provinces and Berar as we have no surplus agricultural labour.

QUESTION 19.—FORESTS.—(*a*) For reasons given in reply to Question 16, I consider that no permanent good to agricultural interest would result from a general extension of the present facilities for grazing in forest areas. In order however to utilise the forests still further to meet the needs of the agriculturist I consider that suitable forest areas should be devoted to cattle-breeding on a properly organised basis. This department has at present one or two such schemes under consideration and when suitable breeding stock is available it is hoped that this system will be more widely adopted. A forest area which could provide good bullocks and milch cattle should be of more value to the country at large than it is at present in suppyling a certain amount of timber and grass. The total amount of forest required for cattle-breeding purposes would only form a very small fraction of the total forest area in the Province.

(*b*) Please see paragraphs 64 to 66 of the "Memorandum on Rural conditions and Agricultural Development in the Central Provinces and Berar" (pages 8 and 9 above) and also replies to (*d*) and (*e*) of this question.

Recent experience in Berar indicates that there is likely to be a keen demand for baled grass from reserves close at hand, but not if the grass has to be brought any considerable distance. For example, few purchasers were found for the baled grass produced in the Nimar Division, but there was a large demand for that available in the Ambabarwa reserve which is in Berar itself.

(*d*) In my opinion, steps should be taken to prevent the erosion of the soil by the monsoon rains particularly in the neighbourhood of large rivers. Deep ravines or *nullahs* are gradually being formed and much soil is being washed away. It should be possible to undertake the planting up of these areas with trees on the lines of *Donga* reclamation which has been successful in South Africa. When once soil erosion has been arrested, a crop of grass will naturally follow in areas where at present the soil is absolutely bare.

(*e*) I consider there are such openings where fodder and fuel supplies are scarce and where waste land exists in the neighbourhood of villages.

QUESTION 20.—MARKETING.—(*a*), (*b*) *and* (*c*) A special report on marketing is being submitted. Please see also Chapter IV of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" (pages 2 and 3 above).

(*d*) Yes and if the special crop committees as recommended in reply to Question 1 are appointed, they would form a suitable agency to collect and give publicity to such information, since the proposed constitution of these committees includes representatives of the trade and of growers. There is considerable need for Departments of Agriculture to get into still closer touch with the trade so that we can obtain specific and detailed information regarding defects in Indian produce. Such information should include figures regarding the monetary loss incurred by placing inferior material on the market and the gain which would follow the substitution of a superior article for an inferior one. This is necessary because the ordinary agriculturist must have concrete figures placed before him. Such generalisations as the loss of status in the world's market or the threat of competition arising in other countries are too general to make any effective appeal.

QUESTION 22.—CO-OPERATION.—(*a*) In view of the importance of the co-operative movement in a tract so pre-eminently agricultural as the Central Provinces and Berar, I consider that the Co-operative Department should be under the control of a whole-time officer specially trained in the subject. This officer should remain in charge of the Co-operative Department for a sufficient number of years so that his experience would be of continually increasing value. He should work in close association with the Director of Agriculture and any arrangements made for improved propaganda work on behalf of the Agriculture Department should include similar work on behalf of co-operation. The subject of co-operative marketing should also be developed, as by following such a system it is expected that definite financial profits would accrue to the cultivators and they would see that co-operation was something more than ideal in that it led to really practical advantages. The extension of co-operation by means of non-official agencies would be much easier after its financial benefits had been realised and the inculcation of a better public spirit, on which the co-operative movement really depends, would be stimulated.

(*b*) (i) to (v) Credit societies, purchase societies and societies formed for the sale of produce or stock can, I think, all be brought together under one organisation. Such societies, in which some obvious financial benefit is likely to result, should receive the first consideration and when they have been established on a sound footing it will be easier to develop more general societies, such as those for effecting improvements for the common good and for dealing with difficult problems such as the consolidation of fragmented holdings.

(vi) Societies for the co-operative use of agricultural machinery have, I believe, a future before them, particularly now that labour-saving machinery is becoming necessary. The types of machinery which might be brought into greater use on a co-operative basis are cotton ginning plants, threshing machines, sowing machines, ploughs worked by power, etc.

(vii) I do not consider there is large scope for joint farming societies, as farming is so much a matter for the individual and it would be difficult to get a number of men to agree as to the proper method and season to be followed in carrying out agricultural operations. It might be possible in the case of a number of capitalists who would employ a well-qualified manager, but at present there appears to be no demand for such organisations.

(viii) Cattle-breeding societies are also a form of co-operative oragnisation for which I do not think this Province is prepared, as the proper breeding of cattle is so essentially a question in which personal control, interest and individualism are concerned.

(ix) I consider there is great need amongst ordinary village committees for some communal effort leading to the betterment of village life. In this direction, there appears to be considerable scope for work by retired Government officials if only they are prepared to go back and live in the villages. This might necessitate the issue of loans to enable such men to take up agriculture on a satisfactory basis.

(*c*) I am certainly of the opinion that where co-operative schemes for joint improvement are necessary, legislation should be introduced in order to compel an unwilling and small minority to join a scheme which is for the common good of all. For example, if there is a large area of ground-nut in a village and this is subjected to attack by wild pig it is much more economical for all persons growing the crop to join together for the common fencing of the crop or for watching the same. A few growers should not be allowed to remain outside the common organisation thereby, in all probability, only affording insufficient protection to their crop and providing a bait to draw the pig to the vicinity.

(*d*) I consider that many credit and purchase societies have attained their object but that constant and detailed supervision is necessary to keep them on the right lines. There is also occasionally a tendency to attach too much importance to the making of large profits to the detriment of other objects of general public advantage which should receive more consideration if the true spirit of co-operation is the real guiding motive of the societies.

QUESTION 23.—GENERAL EDUCATION.—(*a*) Existing systems of education do not, I believe, pretend to have any influence on the technical agricultural efficiency of the people. Their main object is to raise the general standard of culture and in

this movement the agricultural community shares. In my opinion, however, the education generally provided, whether higher, middle or elementary, does not tend to turn the middle classes towards an agricultural vocation.

(*b*) (i) Rural education needs to be developed on lines of its own and there is a paramount need for elasticity in the treatment of its problems. The introduction of the definite teaching of agriculture into a certain number of middle schools may yield good results in some places and we have a promising experiment at Powarkhera near Hoshangabad. The attempt to teach agriculture as a vocation was a failure both at this school and also at another started at Chandkhuri in the Raipur district. The Members of the Royal Commission will have opportunities to see both of these institutions.

(ii) I have very little experience of compulsory education in rural areas but I believe such compulsion would be more acceptable amongst some classes if a subsidiary industry (*e.g.*, rope making), were taught. The danger would be that a boy would be removed from school at the earliest possible age when it was found he had picked up the rudiments of an occupation.

(iii) When a boy reaches the fourth class, he is just about of an age when he can begin to earn his own living or at least add something to the family finances. The few annas he can earn daily are of more apparent value than extra years spent at school.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) There is one obvious method of inducing a larger number of men of capital and enterprise to take to agriculture, *viz.*, to make that profession more profitable. In this connection, I do not consider it necessary to increase the present facilities available in this Province for obtaining education in the technics of agricultural practice. This could be considered when the present facilities are fully utilised.

(*b*) I do not think there are any important factors tending to discourage owners of agricultural land from carrying out improvements except the general lack of interest evinced in all questions regarding rural welfare.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) I consider the agricultural prosperity of the rural community to be very closely associated with its health, and improvements in the hygienic conditions in rural areas should advance side by side with the efforts which are being made to improve the agricultural conditions of the people.

(*b*) In my opinion, economic surveys in typical villages will yield results of considerable value. These should be conducted by agricultural officers with a bias towards economics or by students of economics possessing a knowledge of and sympathy with agriculture. A special staff is, I think, essential as this work cannot be added to the already onerous duties of Deputy Directors of Agriculture.

(*c*) Economic surveys have been made in two villages in this Province by Deputy Directors of Agriculture. The report on one of these enquiries is now being printed.

QUESTION 26.—STATISTICS.—(*a*) (i) Please see reply to Question 1 (*b*) regarding the need for a Statistical Officer.

The figures for areas under cultivation and crops are, in general, sufficiently accurate.

(ii) Far more crop cutting experiments are needed in order to obtain a more reliable figure for the yield of crops. The district staff of the Agricultural Department undoubtedly provides a suitable agency for conducting such experiments but at present the numerical strength of the staff is too weak to enable sufficient experiments to be made in order that a sufficiently accurate figure for average yield may be obtained. When we have reached our present aim of one assistant per tahsil or taluk, more reliable figures will be possible. By that time our staff, many of whom are still young and inexperienced men, will be more qualified to deal with this subject, which is one requiring a considerable amount of local knowledge and observation.

(iii) I have no suggestion to make. The present organisation is satisfactory and the figures sufficiently reliable.

(iv) This information must be obtained from village records maintained by the subordinate staff of the revenue officers. The agricultural officer should have nothing to do with it.

Oral Evidence.

27453. *The Chairman*: Mr. Plymen, you are Director of Agriculture in the Central Provinces and Berar?—Yes.

27454. You have provided the Commission with a note of the evidence that you wish to give. Is there anything which you would like to add to the written note at this stage?—No.

27455. Would you please give the Commission an account of your own training and past appointments?—Before coming to this country, I was for 6 or 7 years on the staff of an Agricultural College in England. For the first part of that time I was acting as an Assistant to Sir Daniel Hall and then I worked largely on chemical work, but I undertook a certain amount of external work, in a way, giving lectures to farmers and gardeners. When I joined this department, my first appointment was that of Agricultural Chemist. Since then I have been at various times a Deputy Director and Principal of the Agricultural College.

27456. *Sir Henry Lawrence:* Under Government?—Yes. The whole of my service, except for a short period during the War, has been spent in the Central Provinces.

27457. *The Chairman:* To be sure that the matter is quite clear, would you please give us a statement showing the organisation of your department both at headquarters and in the districts, mentioning the grade of officer holding each group of appointments. There is yours at the head?—Yes. Then under the Director of Agriculture there are the Deputy Directors in charge of the following Circles. The Northern Circle—headquarters Jubbulpore; the Western Circle—headquarters Amraoti; the Southern Circle—headquarters Nagpur; the Eastern Circle—headquarters Raipur. There is also a Deputy Director of Animal Husbandry with headquarters at Nagpur. Those are the officers concerned with general agriculture. Then also we have, in Nagpur, a scientific staff and there is the Agricultural College with its Principal. There are the Agricultural Chemist, two Economic Botanists and the Mycologist. Those are all officers of the status of the present Imperial Agricultural Service. There is also a post of Agricultural Engineer which is at present vacant. He holds an outside post not on the cadre of the Indian Agricultural Service. I would perhaps add here that the Agricultural Engineer has just resigned. The Agricultural Chemist is now going on long leave and probably will take proportionate pension.

27458. Would you give us particulars of the organisation within the Circles?—Under each of those officers, there are one or more Provincial Service officers whom we term, in this Province, Extra-Assistant Directors of Agriculture. For instance, in the Raipur Circle here we have two Extra-Assistant Directors of Agriculture. They take one or more districts and are responsible for controlling the extension work, that is to say, the demonstration work of the Agricultural Assistants under them. So that we have in a Circle the Deputy Director of Agriculture at the top who is responsible for the whole work. We have the Extra-Assistant Directors of Agriculture under him who are not concerned with the experimental work but are only concerned with the demonstration work, and under those men we have the subordinate staff of the Circle, the Subordinate Agricultural Service.

27459. All one grade?—The Subordinate Agricultural Service is divided into an Upper and a Lower Division. We recruit directly to the Upper Division, but as a rule promotions are made from the Lower Division to the Upper. We recruit to the Upper Division direct from the Agricultural College, men who have passed out well and have taken a four-year course.

27460. And do both Upper and Lower Divisions do propaganda work?—Yes, they are engaged entirely on propaganda work except such of them as work on the farms. We have two classes of farms, seed and demonstration farms which are under the Provincial Service officers and the experimental farms which are under the direct control of the Deputy Directors. I have had a map prepared to show the distribution of those farms throughout the Province.

27461. May I ask you to turn to your note in answer to Question 1 (*a*)? At the commencement of the fourth paragraph on that page you say, "For the administration of the fund, I propose that a number of sub or crop committees

should be formed dealing with the main crops", and then you give a list of the crops. That would be an All-India committee; would it not?—Yes.

27462. And do you envisage provincial crop committees?—No, the whole of the advisory work in the Provinces should, I think, be left in the hands of the present Advisory Board of Agriculture which consists of a certain number of official and a certain number of non-officials.

27463. You are familiar with the working of the Indian Central Cotton Committee?—Yes.

27464. Is it your view that the cultivator is adequately represented in that organisation?—Yes, from what I have seen of the working of the Central Cotton Committee, I think the needs of the cultivator are well looked after.

27465. It is very important that they should be, is it not?—Yes, most important. We have representatives of crop growers on that committee and my own feeling is that the needs of the cultivator are well looked after by the Indian Central Cotton Committee. The point has been brought forward by a certain Deputy Commissioner in this Province that the representatives of the growers should perhaps be men who are entirely cotton producers, and we perhaps do not often select these men in quite a satisfactory way. That particular Deputy Commissioner said that he could give the names of ten or twelve good cotton growers who would be suitable members of the Cotton Committee and I stated that the first requirement would be that they should be able to deal with the proceedings of the Cotton Committee which are all in English. "If that is the case", he said "I cannot recommend men who know English as they are not available". I pointed out that for a committee of this sort, which was representative of the whole of India, English was obviously the only language in which the proceedings could be conducted. The fact that the proceedings of this Committee are conducted in English does eliminate certain men who would otherwise be very desirable members of the Cotton Committee.

27466. If the interests of the growers cannot for this or that reason be looked after by representatives of the growers themselves, then would you agree that officers of the Provincial Agricultural Department ought to be careful to see that the interests of the growers are very closely watched on the Committee?—I think their interests are carefully watched, but it does limit the selection of members who represent the growers.

27467. A little further down you say, "The total fund to be allotted to research might be controlled by a Research Fund Committee....." Would that be a committee of experts?—Not necessarily. I have stated that it would be composed of the Presidents of each sub or crop committee with an officer appointed by the Government of India as President and with such other members as the Government of India might appoint. These officers should be either non-officials or officials.

27468. Having had a Research Fund Committee constituted in that manner, with technical officers representing each of the Provinces, you might find that after considerable argument the funds would be disposed of equally between the various Provinces rather than granted in accordance with the merits of particular schemes advanced. Do you follow what I mean? It might be difficult to get a firm decision if you had equal representation from each Province, especially if those representatives were technical officers?—Well, I did not propose that these representatives should necessarily be technical officers but that they should be men with a broad view, a broad knowledge of the needs of the agriculture of the various Provinces and who would be able to allot funds on the merits of schemes put before them.

27469. So that you agree with me that the merits of these schemes should be a prime factor?—Yes, and the claims of the Province should be a secondary factor.

27470. What is your view of Pusa and its place in the agricultural system of this country?—Pusa was started before the provincial departments got going, and I cannot help thinking myself, that had it been foreseen that provincial departments would be organised on the lines and to the extent to which they are at present, Pusa would not have developed as it has. Pusa was developed as a Central Institution, I think, before it was realised that provincial institutions would arise which would to a certain extent take the place of Pusa.

27471. Do you think that Pusa is at this moment rendering good service or not?—No. I do not really think as the provincial departments are organised at present that Pusa affects them much. We have very few problems which we refer to Pusa.

27472. *Sir Ganga Ram:* When you say that you do not think it affects them much, what do you mean?—I mean that it does not benefit them much.

27473. *The Chairman:* Are there not problems of a basic nature and of general application to which a central institution may well devote its attention?—I find very few problems from the Province are ever sent up to Pusa. We occasionally are asked to suggest problems, but for years no problems have been suggested from this Province which Pusa can undertake.

27474. But that may be the fault of the Province, may it not?—I think that the Province feels that it is self-contained and that it can tackle its own problems.

27475. You have an important wheat growing tract here?—We have.

27476. What wheat are you growing?—We largely grow our own wheat.

27477. Are you growing any Pusa wheats?—Some of the Pusa wheats are grown in these tracts, but taking them as a whole we prefer our own wheats to Pusa wheats.

27478. Have you an important sugarcane growing tract?—Not an important sugarcane growing tract, but we have a certain amount of sugarcane cultivation.

27479. Is it a dry or an irrigated tract?—It is an irrigated tract. We have found the Coimbatore canes most useful. In fact, the Coimbatore canes are gradually replacing our local canes. We have really found the Coimbatore Station of great value to us in producing canes suitable to this Province.

27480. *Mr. Kamat:* Have you derived more advantage from Coimbatore Station than from Pusa?—We have derived more advantage from the Coimbatore Sugarcane Station than from Pusa as a whole.

27481. *The Chairman:* What do you say about the touch or the want of touch between your Agricultural Department, particularly on the research side, and the departments in other Provinces?—In replying to this question I am speaking as an officer of the scientific section. I do not think the officers of the scientific sections find any difficulty in keeping themselves in touch with the officers doing similar work in other parts of India. It is their business to do so.

27482. How do they keep themselves in touch?—By private correspondence, if necessary, and by reading particular publications just in the same way as a man doing scientific work does keep himself in touch with similar work done all over the world.

27483. What are your principal problems to which you are directing your attention at the moment?—On the botanical side, we are devoting our attention to the improvement of crops.

27484. And to what crops in particular, are you devoting your attention?—We have wheat, rice, cotton, *juar* and other main staple crops. On the chemical side, we have the general problems of the soil. They are also dealt with from the bacteriological point of view. Then we have the diseases of plants which are tackled by our own Mycologist who keeps himself in touch with the other Provinces.

27485. What particular diseases, have you been dealing with at the moment?—We are dealing with sugarcane diseases, palm diseases, smut in *juar*, wheat and so on.

27486. Is your chemist in close touch with the work which is being carried on at Pusa in the matter of what you have described as the general soil problems under the chemical side?—He reads the work that is going on in Pusa in the same way as he reads the account of work done in the other Provinces, and also as he hears and reads the account of work that is going on in America or in Europe or in any other part of the world. Any scientific officer dealing with problems of this sort has to read widely.

27487. Could you tell the Commission whether the Mycologist in this Province is familiar with the work which is being done on the smut diseases of *juar* at this moment in the neighbouring Provinces?—Yes, I believe he is quite familiar.

27488. Do you regard occasional personal visits to the neighbouring institutions as highly desirable?—Any application I make to the Local Government for an officer of my department to visit any other part of India is always dealt with in a very liberal spirit. But I think it is desirable for an officer to visit another part of India with a very definite problem in view and not merely to see things in a general way.

27489. Have you anything which you would like to say to the Commission on the question of Pusa's future as a Central Institute for post-graduate training?—We have had a certain amount of experience with men who have undergone post-graduate training at Pusa and my feeling is that perhaps that training is rather narrow. I may perhaps give a concrete illustration. I had an Agricultural Bacteriologist who went to Pusa for training, after having received his preliminary training in Nagpur Agricultural College. While at Pusa, he came in contact with one officer in the Chemical Section and one or two officers in the Bacteriologist Section. This officer seemed to be a very promising young man and so I proposed to the Local Government to provide him with special facilities and send him to England for training. He was admitted to the Rothamsted Experiment Station for a year. During the time he worked at Rothamsted Experiment Station, he had the opportunity of seeing a large number of people from all over the world who came there. He also attended two meetings of the British Association, one at Rothamsted and the other at Oxford. He also attended a course of lectures at the Cambridge University with a letter of introduction from a friend at Rothamsted. Then he went to France and saw some of the leading bacteriologists there. All this was done in the course of one year and I cannot help thinking that the money we spent on sending that man to England for a year's training was of far greater value than the money spent in sending him to Pusa for a similar period.

27490. *Prof. Gangulee:* What was his subject?—Agricultural bacteriology.

27491. *The Chairman:* But there had to be some foundation before he was capable of taking advantage of a visit to Rothamsted and the Continent?—He had a very good foundation at Nagpur and I think the foundation we are able to give at Nagpur would be quite sufficient to enable such a man to take every advantage of a training in England. The graduates of the Nagpur University are accepted as such by the Home Universities.

27492. At what stage in his career, do you think an Indian should leave India for experience abroad if that is necessary?—I think he should go either to Pusa or abroad when he has shown decided ability in some particular subject. That may be a year after he has graduated or it may be during the course of his graduation. It might perhaps be desirable for him to take some kind of refresher course after he has had four or five years' service in a provincial department.

27493. Do you think that experience shows it to be a good thing to send a young Indian to Europe immediately after he has graduated?—In the Agricultural Department we have had only a very limited experience of that.

27494. How about study leave later on in a man's career? Do you attach great importance to that?—This particular man about whom I referred just now went on study leave.

27495. *Prof. Gangulee:* Have you got him in service now?—Yes.

27496. Is he in the Imperial grade?—He is in the Provincial grade.

27497. Although he obtained a first class education in bacteriology abroad, he is still in the Provincial grade?—There is no recruitment to the Imperial grade now. We have only the Provincial grade.

27498. *Sir Ganga Ram:* Did you take any guarantee from him when he went abroad that he would return to your service when he came back to India?—He was under no particular contract; he was already in Government service and he had been in Government service for a good many years.

27499. Supposing another Province took him on?—If another Province could offer him better terms and if our Province would allow him to go, he would go.

27500. *The Chairman:* I think you say somewhere in your note that you are anxious to appoint an Agricultural Economist?—I think in answer to Question 4 I have suggested the appointment of a special officer.

27501. I was going to ask you in relation to research whether you would direct him to the carrying out of complete costing operations on units typical of the holdings in this Province?—I think information on the economic side at present is far too meagre and that is really the side on which we now want to specialise.

27502. Would you agree with me that costings of a typical holding is about the only way by which you can arrive at a definite conclusion?—That is the primary way in which the question should be tackled at the start. We have no officer at present who is doing the work of an Economist and I think we should have an Economist just as we are having an Agricultural Chemist or a Bacteriologist or a Botanist.

27503. *Prof. Gangulee:* Where would you train him?—I am afraid at present I can see no facilities for training such a man in India unless he is a man who is kept in a local Agricultural Department and put down on that special work under the general supervision of other officers.

27504. *The Chairman:* I have been looking at your answer to Question 2 (i) where you refer us to Chapter XVI of the "Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar" which has been in the hands of the Members of the Commission for some months. I should like to ask you at the outset what your experience here at the College has been of the inter-action of teaching on research?—Our research workers are responsible for the teaching in other subjects in addition to research work and my own feeling is that in the past they have devoted too great a proportion of their time to the teaching work, to the detriment of the amount of time that they could devote to research work.

27505. That does not mean that teaching has a bad influence on research?—It has no bad influence within limits, but I do not think a research officer ought to be tied down too much to teaching.

27506. Am I right in saying that that is so when the teaching is too elementary and there is too much of it?—That is the thing that happened in my own particular case. When I joined this department as Principal of the Agricultural College I taught general chemistry and inorganic chemistry and also bacteriology. I was also responsible for teaching some physics, and all for the sake of a few students.

27507. Has it been your experience at the Agricultural College that there are certain of your students who do not go in for Government service?—There are a few such men, but up to the present time we have needed Agricultural Assistants so badly that we have taken on almost as many men as we produced.

27508. All the good men?—Yes, all the good men.

27509. Has there been any demand from the public for your students, for the purpose of managing either estates or cattle farms?—There has been very little demand of that kind in the past.

27510. Would you regard it as very important to develop it as much as possible?—It is extremely important to do so.

27511. Especially to encourage the view that the College is something more than a place for training officers?—There will have to be more openings for men who are trained at the Agricultural College. I anticipate that in a few years' time we shall have far more men turned out of the Agricultural College than we can possibly hope to find posts for. We have, at the present time, in the Nagpur Agricutural College, about 110 students, and our recruitment in the near future is not likely to be more than five a year.

27512. *Sir Henry Lawrence:* Are they taken into Government service?—Not now.

27513. *Sir Ganga Ram:* Into the Irrigation Department?—No.

27514. *The Chairman:* Would you like to see the agricultural degree made a qualification for appointments other than in the Agricultural Service?—I should like to see it as a qualification for any service in which a knowledge of agriculture would be valuable.

27515. Have you ever thought of the possibility of founding a degree in agricultural economics, or rural economics to use the wider term?—I should like to make rural economics or agricultural economics such an important subject of agricultural education that it be unnecessary to establish another degree.

27516. You would have one degree in rural economics because rural economics has a much wider field than agricultural economics?—It is wider, but in this country rural economics and agricultural economics are so closely bound up together that one could make a degree in agricultural economics almost wide enough to include both. I think it is important that some of the Indian Universities should realise the value of agricultural or rural economics. I would like to place before you the position which I put forward in this connection in Nagpur a short time ago. I was asked quite unofficially whether I could suggest for the Nagpur University something in the nature of a Chair. I said, 'Why not have a Chair in Rural Economics'; the idea seems to have struck them, and I am hoping that something will come out of it. I think that in a University established in such a prominent agricultural tract as this, a Chair in Rural Economics is of far greater importance than say a lectureship in Sanskrit or something of that sort. The Nagpur University has been newly established, and they have just recognised the Agricultural College as a constituent.

27517. *Dr. Hyder:* When a Chair in Rural Economics is established in Nagpur University, it will provide post-graduate training for the students?—The lectures in rural economics would be such as would be valuable and suitable to students taking a degree in general economics or to students in the Agricultural College, because I do feel that the agricultural course wants to be made more and more economic and perhaps a little less scientific. I think we perhaps teach to the general run of our agricultural students rather too much science and too little economics.

27518. Have you looked into the Economics course of the Nagpur University?—No, I have nothing to do with it.

27519. *The Chairman:* Your reply is that your college is linked up with the University?—Yes.

27520. You have got your Agricultural College, and you are making at least one experiment in semi-vocational middle schools. Would you agree that it is very important that the future careers of the young men or boys passing through all such institutions should be watched and recorded?—I think it is a matter of the greatest importance.

27521. Is it being done at the moment?—I have supplied the Powarkhera school with a card index and they have to keep a record of each boy who passes through the school, as long as possible.

27522. How long has it been run?—On reorganised lines, for a year; in order to get this information I had got them to collect information regarding past students; recently I have supplied them with this card index, in order to keep a full, detailed account of each student who comes to that school. We have had a few students there, and they have a record of what is happening, but now that the numbers are increasing, I think it is very essential, in order to see the value of this experiment, to keep a complete record of the boys that go through it. That applies to the agricultural middle school at Powarkhera.

27523. In answer to Question 2 (x), you are talking about the problem of making agriculture more attractive to middle class youths, and you say that that may come about when the general conditions of rural life are more attractive and when there is full scope for the energies and abilities of these middle class youths. Do you think it possible that agriculture could be made attractive to middle class youths on holdings as small as those which represent the average in this Province?—I am afraid it is not so.

27524. Is that not really the problem of the smallness of the holdings?—I think it is; the man would make insufficient money to live properly in a village.

27525. Please turn to your answer to Question 3 (*a*). The Commission wish to follow the memorandum on page 41, chapter XIII (pages 14—18 above). Is it your view that the problems of demonstration and propaganda have received

sufficient attention in the past in this Province?—They have received as much attention as we had staff for, but I think the methods of propaganda and demonstration require to be made more attractive and more appealing.

27526. You think that demonstration and propaganda have received as much attention and have enjoyed as much financial support as research?—They have, quite as much as research.

27527. You think there has been a fair allocation between propaganda and demonstration, on the one hand, and research on the other?—It has been quite fair; it is in favour of extension and demonstration.

27528. As between the two types of cultivation, the irrigated (which of course is only a small part in this particular Province) and the dry tracts, has the attention of your department been fairly divided between those two classes of cultivation?—Yes, I think it has been; we are trying to work up to the position of one Agricultural Assistant per tahsil, whether it is in the dry tract or in the irrigated tract; that is our present aim.

27529. No doubt, where irrigation is possible, irrigation is the thing, but there are some districts which cannot be irrigated?—Yes; they have not been neglected. For instance, as far as we can provide the Agricultural Assistants, we place them in the Western Circle for cotton, in the Northern Circle for unirrigated wheat or in the Eastern Circle for sugarcane, rice and so on.

27530. Have you ever noticed the tendency or temptation to devote more attention to the irrigated areas than to the dry ones?—Not in this Province.

27531. We were talking about field demonstrations a little while ago, and in answer to Question 3 (*b*), you go a little more into detail about your demonstrations and how you carry them out. How about the class from which your demonstrators are drawn; are they from the rural class, as a rule?—They are from the rural class, but one must realise that in the Agricultural College in the past we have admitted non-matriculates, and I suppose we are the only department who have taken a non-matriculate, given him training at a fairly cheap rate, and provided him with a post on Rs. 50 a month. We are still taking them, although we hope to improve the standard, now that degrees in agriculture are available.

27532. Is not the training of your demonstrators mainly technical?—The demonstrators are either given the short course at the Agricultural College, which is largely agriculture or the long course, but it is our policy not to put a man out on demonstration in the district until he has had at least two years' further training in agriculture on one of our farms.

27533. What object have you in view in making that rule?—Because we do not think that he is a sufficiently good agriculturist to be trusted to go out and advise people on the basis of two years' training.

27534. The two years' training gives him technical knowledge; does he acquire any commercial knowledge and knowledge of management?—It gives him technical knowledge, but not experience; he has two seasons on the Nagpur College farm, but they may be the same, or they may be different, and that is not quite sufficient basis upon which to turn that man loose on the agricultural public as an adviser.

27535. You would agree that some knowledge of farm management is essential in the case of a demonstrator?—Yes, and it is for that reason that we keep him on one of our farms. I have had the case of a man put out on demonstration duty after a short period of training, who has begged me to take him back and put him on a farm, because he did not feel he was up to his job. From that may be realised, perhaps more than from anything else, the need for giving those men a larger practical training before allowing them to become general advisers.

27536. If a cultivator discovers that a demonstrator, representing the department in his area, does not know the things about farm management which the cultivator has learnt from his father, does he not think the demonstrator a fool?—Exactly; there is an erroneous difference between the influence of the man who knows his job well and the man who does not.

27537. Are you satisfied with the manner in which the records of past experience are being kept in your department in this Province?—I think, taking the officers of the department as a whole, they all have too much to do, and that is one of the reasons why I have suggested that we want a Statistician and an Economist, who would take up some of the work of keeping the records.

27538. I am not thinking at the moment of the interpretation of results, but merely of the machinery for recording experience. Men come and go, and unless pains are taken to record experience, whether it is one of success or failure, it is likely to be lost?—There is a danger of losing experience; there is that distinct danger, particularly if you have a man breeding crops; if that man does not keep a well written account of the history of the crop you may produce a new variety and you do not know the history at all. There is that danger. In general, I think, the annual reports regarding the use of various things are kept; but there are personal touches which should be recorded also and which are of extreme value.

27539. There is nothing at the present moment in any of the Provinces of India comparable to the Ministry of Agriculture at Home?—No.

27540. I take it that the administrative records are all in the Secretariat?—The annual reports are all filed.

27541. The experience on the administrative side is kept by the Secretariat and not by you; is it not?—The Secretariat keeps the annual reports on the working of the department. Each office keeps its own files, the annual reports of these experimental farms, demonstration farms, extension work and so on.

27542. Let us take a concrete case which has emerged in another Province. Are you attempting to popularise the method of preserving fodder by making it into silage?—We are, yes.

27543. For how long is that going on?—It has only been going on for the last one or two years.

27544. You agree that that is the sort of experiment of which the most closely kept records should be preserved?—Yes.

27545. Would you put in a paper summarising the efforts that have been made and the results so far obtained in that direction?—Yes; shall I send it to Nagpur?

27546. There is no hurry; but if you can do so it would give an opportunity to the Commission of asking some of the witnesses about it?—Yes.

27547. I see that you say, "There is also a need for a Bureau to summarise the work already done in the Central Provinces and to maintain such a summary in future years. This could be maintained by the Central Government". Why do you invoke the Central Government for that particular purpose?—I say it could be maintained by the Central Government because the Central Government or the central organisation could collect all the material from all Provinces.

27548. Is that so as to bring it together for the purpose of comparison?—And make it available to any one who wanted it.

27549. Does that suggest to your mind that there is not quite the degree of co-ordination and communication today which you suggested in your evidence some minutes ago?—The material is available.

27550. It is not at the moment at the disposal of the Provinces?—If any particular officer wants information on any point, he could always write to another Province to the officer in charge of the work and get it; it is not publicly available.

27551. Now in answer to Question 4 (c) (ii) you say, "The present regulations regarding railway rates for the transport of agricultural produce, machinery and other requirements need to be closely examined", and then you give a specific instance. What representations have been made by your department, to whom and with what result?—As far as I know, no departmental representation has been made on the question of the sugarcane mills. That has been shown me as a most important hardship. With regard to oil-cakes, I think that was done some years ago when we wanted oil-cakes to be carried at a uniform rate.

27552. What body representing the Railway is existing in this Province to listen to the complaints of the cultivators?—There is an Advisory Board for the G. I. P. Railway.

27553. Is that the Local Advisory Council?—Yes, at Nagpur.

27554. Instituted as the result of the Acworth Committee of 1920?—Yes. I am unaware of any definite complaints from agriculturists having reached them.

27555. You probably agree that in the present state of development, the Indian cultivator is in no position to carry his complaints to the Railway Companies?—I am afraid he is not.

27556. *Mr. Kamat:* Have the manufacturers of these sugarcane mills represented their grievance?—Not that I know of.

27557. Have you got local manufacturers?—No.

27558. *The Chairman:* Following on your answer to me, would you agree that that fact makes it more important that the Department of Agriculture should watch the interests of agriculturists in these matters?—We do try and watch the interests of the cultivator. When the cultivator has a point of this kind to bring forward I would say the Provincial Board of Agriculture, the Advisory Board in Agriculture, is of increasing value. It acts as the Standing Committee in agricultural matters to the Local Government. For example, no new proposal to be included in the budget is accepted by the Local Government unless it has been passed by this Advisory Board which consists largely of non-official members representative of the different agricultural tracts, and a certain number of official members.

27559. *Sir Ganga Ram:* Are they members of the Council?—Some of them may be Council members, but not all.

27560. *The Chairman:* The heads of the Railways when they were asked about the interests of the cultivator have cited the Local Advisory Councils and indeed they told us precisely how the representation of the cultivators' interests has been arranged for. It was, if my memory does not deceive me, by two members of the local Legislative Council chosen, I think, from rural areas. Would it not be worth while that your department should look into the possibility of assuring for the cultivator an active representation on the Railway Local Advisory Committee?—I think that could be taken up with more chance of success by the Advisory Board of Agriculture.

27561. As head of the department, do you put up suggestions of that sort to the Advisory Board?—Yes; if there is a matter of that sort, it is put up.

27562. How about construction; are you satisfied with the amount of railway construction going on in the Province as a whole?—Yes; I think the railway provision in this Province is, on the whole, very satisfactory.

27563. In answer to our Question 4, you deal with various points subsequent to those with which we have already dealt. But I see that you say nothing about the Post Office. I was wondering whether you regard the service of the Post Office, in its capacity as public agent for the Savings Bank system, as giving it importance in relation to agriculture?—No; I had not anything definite to say about the Post Office.

27564. Now, I am looking at your answer on page 28 to Question 6 (*a*), (*b*) and (*c*) and to the Provincial Memorandum, paragraph 45 (page 6 above). You say, "There is considerable scope for giving assistance to the cultivator through such financing agencies as land mortgage banks". You suggest also 'a whole-time officer who could specialise in the subject'. Would that be a whole-time officer for the whole Province?—That was my intention, yes.

27565. Do you think that one whole-time officer for the whole Province could do much? Is it a question of research which was in your mind?—The question of organisation and the preparation and development of schemes for this work, a man who would make a special study of the financing of agriculturists.

27566. Do you think sufficiently detailed investigation of the problem of indebtedness has been carried out in the Province?—I do not know; I think it requires far more investigation.

27567. Is there any statement available showing the particulars of debt, secured and unsecured debt to moneylenders, debt to co-operative societies and so on?—Not that I know of.

27568. Are you one of those who attach great importance to the carrying out of preliminary surveys before laying down a policy?—I think this question of indebtedness does require a very close investigation.

27569. You do not suggest, do you, that one officer for the whole Province could make much contribution towards an investigation of that sort?—No, but that is a step in the right direction.

27570. I turn to the note* which is headed "Note relating to the Acts in force in the Central Provinces and Berar which affect agricultural matters from the economic point of view." Pages 3 and 4 deal with the Agriculturists' Loans Act No. 13 of 1884 and with the Lands Improvement Loans Act; on page 4,

*Not printed.

second paragraph, you say, "Government has also recently sanctioned as an experimental measure a scheme for the supply of pure wheat seed on the *barhi* system". Is that under the Act of 1884?—No. I am not responsible for that note; that was drawn up by the Secretariat.

27571. Have you not seen it?—I have had a copy of it.

27572. Perhaps you will give me the facts as far as you are aware of them?—That was a special scheme started last year and does not, I think, have any reference to that Act you quote.

27573. So far as you know, it is neither under the Act of 1884 nor under the subsequent Agriculturists' Loans Act?—Speaking from memory, I do not think so, but it was only started just before I went on leave and I have not seen the details of the working of it.

27574. What is the *barhi* system?—It is the giving out of loans with a return of 25 per cent interest in kind.

27575. As you are not responsible for this paper, you must stop me if you do not want to answer any question; but it touches your responsibility I think closely in many respects, and so I will take you as far as you are prepared to go. The writer is talking about interest on loans under the Agriculturists' and Lands Improvement Loans Acts and he is dealing with the question of the interest charged to the cultivator. "During 1921-22 the interest was raised from 6¼ per cent per annum to 7¾ per cent, or 1 anna 3 pies in a rupee, in order to cover the high rate of interest payable by the Local Government to the Government of India at the time, and also to protect the provincial finances from probable losses owing to bad debts. At present the rate from Provincial Loans Fund is fixed at 5 per cent, but there has been no reduction in the rate of interest charged to the cultivator." Are you familiar with the circumstances?—No.

27576. Then I observe it is the practice in this Province to remit interest on *taccavi* instalments whenever land revenue is remitted?—Yes, that is probably the case, but really it is not a thing with which the Agricultural Department has any concern.

27577. Have you not interested yourself in the general problem of dealing with the indebtedness of the cultivator?—We are interested in the issue of *taccavi* loan but not in the general regulations covering it.

27578. Now I turn to Question 8, which deals with Irrigation. Are you satisfied with the degree of touch and inter-communication existing between your department and the Irrigation Department?—Yes.

27579. Are relations thoroughly amicable?—We are in constant communication, either by letter or by oral discussion. I can give an example which happened only quite recently: the Irrigation Department found that the water from one of their tanks was not being taken up quite as readily as they had hoped, and they asked us if we could open a demonstration plot. We opened one within a fortnight in that area. We do a great deal by discussion; I see the Chief Engineer very very frequently and I am also in close touch with the Superintending Engineers as well.

27580. I suppose you also meet on the Provincial Board of Agriculture?—The Chief Engineer is a member of the Advisory Board for Agriculture.

27581. How often does the Advisory Board meet?—It meets two or three times a year to discuss the budget items, and at one other time at least.

27582. How about the advice that the two departments give to cultivators? Are you agreed together as departments in the matter of the quantity of water required for sugarcane growing?—Well, we have our views; in a general way I should say the Agricultural Department would put rather a lower figure for water required for sugarcane than the Irrigation Department.

27583. I think that is quite possible?—Yes.

27584. *Prof. Gangulee:* You have no experimental data with regard to that point?—Experiments have been conducted and are now going on with regard to the duty of water for various crops.

27585. When was that experiment begun?—That was started by the Irrigation Department two or three years ago in consultation with the officers of the Agricultural Department; the experiments have been opened by the Irrigation Department.

27586. *The Chairman:* Have you anything that you wish to tell the Commission on the problem of the method of charging for water; that is to say, the volumetric *versus* the acreage basis?—No, except that we are frequently consulted over irrigation rates.

27587. Have you nothing to say about the volumetric method of charging?—No.

27588. Do you think there is an opening for minor irrigation schemes in the Province: such as *kutcha* damming of minor streams and rivers?—I think there is scope for minor irrigation schemes and also for well irrigation; the trouble is to make such schemes remunerative and to pay the interest on the capital involved in damming up such streams.

27589. Are there no districts where cultivators are willing to do the work and to take risk if they are given sufficiently good advice; is there any officer available to advise cultivators?—The general officers in the Agricultural Department would advise on matters of that sort.

27590. But you have no special irrigation officer to advise on such schemes?—No.

27591. Do you not think such an officer could do good service?—It should be one of the duties of the Agricultural Engineer to advise where *bunding* and levelling of land, setting up of irrigation plant, and so on, should be; but as a rule that kind of advice is given by the general officers of the Agricultural Department.

27592. Then I think you somewhere express the view that irrigation by wells is a subject which should receive further attention; is that so?—Yes.

27593. You think there may be an important opening for that, do you not?—I do, but I think the whole question of water-supply by wells is too big a thing to put in the hands of a solitary agricultural engineer.

27594. Do you not think that both these subjects are subjects which should be in the hands of technical whole-time officers?—The minor irrigation schemes, that is to say, the building of small tanks and so on, could well come within the scope of the duties of the agricultural officer, I think, if he could call in technical advice where wanted.

27595. Are you satisfied that there are not problems in research of a fundamental nature in connection with irrigated agriculture which still require to be dealt with?—I think there are problems in connection with irrigated crops, special problems of their own, but these I think could come in under the general survey of the Agricultural Department.

27596. Problems in connection with drainage in relation to agriculture, drainage in connection with irrigation, and problems in connection with irrigation in its bearing upon health and its effect upon the soil, problems of water-logging and so on; do you think that these might well be tackled by a central research station for irrigation under the Government of India?—I do not think that problems of such a nature are very pressing and important in this Province.

27597. Has there been any soil survey carried out in this Province?—Not of a general nature, but we have accumulated a good deal of information on soils as a whole. There has not, however, been any organised soil survey because we have not got the necessary staff for it.

27598. Are you going slowly forward with that work?—Yes, we are gradually collecting more and more information. For instance, at agricultural shows we put up show bottles giving results of the analysis of the soils in a particular area and showing how they differ. We use those as exhibits at agricultural shows.

27599. In answer to Question 9 (*b*) (ii) and (*c*), you give an account of what you have done in the way of clearing land of *kans* grass. How far have these opportunities been taken advantage of by cultivators?—We have two schemes, ploughing with bullock-drawn ploughs for which there is a pretty big demand. We have extended that scheme in the last year and it seems to be a scheme which could be developed almost indefinitely.

27600. What plough are you using for that?—Sometimes the iron turn-wrest plough, sometimes the Sabul plough.

27601. Does the turn-wrest require to be altered so as to adapt it for that work?—No, that plough is available; it is the plough with which we do the work to a large extent.

27602. Then you have got this steam-ploughing plant?—Yes, that has only just been started.

27603. What plough are you using?—It is a four or five bottom plough.

27604. *Sir Ganga Ram:* Is it a double engine?—Yes. It was sanctioned by the Legislative Council during the last budget session and is working for the first season now in the Jubbulpore district.

27605. *The Chairman:* Do I understand that the system was sanctioned by the Legislative Council?—The money was sanctioned by the Council. It was put down as a special item in the budget as one of the items of new expenditure really, after the scheme had been exhaustively discussed by the Advisory Board of Agriculture.

27606. Do you have to present your budget in very great detail to the Council?—In very great detail and very frequently. We have to explain it very thoroughly on many occasions. I first of all have to explain it to the Advisory Board, who may or may not approve of it. Provided it is approved by the Advisory Board, it has then to be explained to the Administrative Department. It probably has to be explained again to the Finance Department, then to the Finance Sub-Committee, and finally probably in a fairly lengthy speech to the Legislative Council.

27607. *Sir Henry Lawrence:* Has the Director of the department no discretion to use his money in introducing new machinery?—Items of new expenditure always have to be approved by the Advisory Board of Agriculture.

27608. *The Chairman:* In detail?—Yes, item by item. I find the Advisory Board of Agriculture extremely useful in that way, because once we have satisfied them that the scheme is a sound one agriculturally, it is of very great assistance to have their support.

27609. *Mr. Calvert:* Are they all members of the Legislative Council?—Not all.

27610. *The Chairman:* Now, in answer to Question 10 on Fertilisers, you say that greater use can undoubtedly be made of natural manures and artificial fertilisers. Do you think the trouble is ignorance or apathy on the part of the cultivator, or difficulty of financing these operations?—I think the whole question is economic. It is very difficult to say that some of the more expensive fertilisers can be recommended for various crops. Although, at the outset when applied to the crop, they apparently give a good yield and look like being a profitable investment, later on we do not find that to be the case.

27611. What is your limiting factor in the Province as a whole?—I should say that nitrogen was the important factor.

27612. *Prof. Gangulee:* Nitrogen is an important factor?—Yes, and water also.

27613. *The Chairman:* What experiments are you carrying on at this moment in compost making?—Particularly in the rice areas we try to use leaves and trash. Of course, in the dry areas the material is not available.

27614. Is that a direction in which you think more research work is required?—I think the whole question of manuring is one in which a great deal of research work is required but it must always be bound up with the economic question.

27615. Are you an advocate of any particular method of compost making at the moment through your propaganda officers?—In the north of the Province, they advocate compost making with all the weeds and general material collected off the fields. We also carried out a certain number of experiments in trying to make artificial manure but we found that the trouble there was to maintain a suitable moisture.

27616. What substance were you using?—*Sann* hemp, refuse grasses, cotton stalks and the like. Again we have been doing it on the Rothamsted method. We found that it was very difficult to keep the manure wet except in the rains; but to rot it in the dry weather was impossible.

27617. Have you any views on the export of bones from the Province?—I should be very glad to see not only bones but also oil-cakes retained in the Province, if possible. Oil-cake, I think, is more important than bones.

27618. How would you use your bone?—Chiefly on the irrigated rice areas.

27619. And process it?—I would grind it up.

27620. Do you not think that they require treatment?—No. It is used in the form of ground bones.

27621. *Prof. Gangulee:* Using a very fine mesh?—Yes.

27622. *The Chairman:* Have you studied the economics of the problem of preventing or not preventing the export of bones?—Not in detail.

27623. Is it your view that the damage done by the use of cowdung for fuel is exaggerated or do you regard it as very serious?—I regard it as very serious.

27624. On page 26, paragraph 67, of the Provincial Memorandum (page 9 above) you say that in the Chhattisgarh Division attempts have been made to encourage the use of firewood as fuel by the establishment of fuel depôts at suitable agricultural centres. How are those depôts supplied? Where do they get the wood from?—From the surrounding jungles.

27625. How could the cultivators get it direct?—The depôts were established in Chhattisgarh but the jungles are a considerable distance from the cultivated areas.

27626. So that it is really supplying wood, not from jungles round about, but from distant jungles?—Yes. And for that reason they hope, with the development of the railways through this district, to be able to get firewood from the jungle at a rate much cheaper than has been possible in the past; it is probable that this scheme will be feasible in the future although it was not a success when it was tried before.

27627. But although the fuel was offered at what is described in this note as being very cheap rates, the immemorial custom of, and the preference for, cowdung fuel prevented the change over from that fuel to wood?—Yes.

27628. For how long was this experiment persisted in?—I am not sure because this was carried out by the Forest Department; it was not done by the Agricultural Department. I think the Chief Conservator of Forests would help you in this matter.

27629. Now under the heading, Crops, Question 11, have you witnessed a change over from food crops to money crops on an important scale in any area in this Province? You do not deal with this question in your note?—There has been a great increase in the cotton area in the last few years. That is one example.

27630. And has it reached a point where an important proportion of the cultivators do not grow sufficient food for their own family use and have to purchase?—I think so. It has reached a point where the pendulum is now swinging in the other direction.

27631. Before we come to that I want to ask you whether you applied yourself at the time when this change over was going on, to discovering what effect the change had upon the cultivator and the economics of his everyday life, while cotton was bringing in a good price? Was it to the advantage of the cultivator to have a change over to the money crop, do you think?—I think it was, while the price remained high.

27632. For the cultivator to get the benefit of the change over it is necessary for him to be able not merely to sell his cotton well, but also to buy the necessities of life that he requires and to buy them well?—Yes.

27633. And in that respect good communications are as important in keeping down the prices of commodities as they are in affording ready channels of marketing for the produce?—Yes.

27634. Do you think it likely that in areas away from large centres and badly served by communications, the cultivator would be able to buy what he requires reasonably cheap?—I think the communications in this Province are, both by rail and by road, good enough to ensure that.

27635. Do you think there is a marked rise in the standard of living amongst the population the members of which change over from food to money crops so long as the price remains high?—I should not say there was a rise in the standard of living. I should say there was a rise in general expenditure.

27636. You mean to say it was not good spending?—It was not spending to the best advantage.

27637. What was the money spent on as a rule? Was it spent on putting tin roofs on the houses?—I should think it was spent probably on getting out of debt.

27638. That seems to me a very good object?—Yes, but there has not been a definite rise in the standard of living.

27639. *Prof. Gangulee:* Is there any sign of prosperity?—In the cotton tract when the price of cotton was high, there were signs of prosperity.

27640. *The Chairman:* Then you say that the pendulum is now swinging back and that the land which has been under money crops is now going back to food crops. Is that very marked?—It is just beginning because the price of cotton now is dropping. We find that a good many people are now taking to ground-nut in place of cotton.

27641. Is ground-nut a food crop of any importance in this Province?—It is not a staple food.

27642. You would not surely describe the change over from cotton to ground-nut as typical of reversion from money to food crops?—It is not exactly a food crop but they are reverting to a rotation of crops which would be to the advantage of the cultivator and of the soil.

27643. Will you give us a little more information about your machinery for distributing seed? I understand that you have an agreement with reliable cultivators throughout the Province?—We have a number of seed farms carried on by reliable cultivators.

27644. How do you reward these seed multipliers?—We do not reward them in any way; they establish a reputation for their seed. I have described the system in paragraph 88 of my memorandum (page 10 above).

27645. Are you satisfied with this system?—I am satisfied with the system, provided we can get sufficient controlling staff.

27646. Do you think you have a fairly accurate record of the total acreage under improved varieties?—The records are all right as far as the seed which is distributed directly under the departmental agency is concerned; but we cannot keep very accurate records of further extensions beyond that.

27647. Do you think there is any hope of establishing in this country, on a commercial basis, the same system of distributing seed as we have at Home?—I think there should be. I think the present seed farmers are enterprising businessmen and they might be able to establish a reputation as seed farmers.

27648. The danger is that they might deteriorate and become first moneylenders and seed merchants afterwards?—Unfortunately the moneylending business and seed business do rather go together.

27649. To what extent are you using the co-operative organisation for distributing improved seeds?—Some of our organisations, more particularly in the cotton tract, are combined co-operative and seed-producing agencies.

27650. Are you using the co-operative organisation as a whole for propaganda purposes?—We work with the Co-operative Department.

27651. Are you satisfied that you have exploited that field to the utmost?—Not to the utmost, but I think we are trying to work together more and more. For example, when there are co-operative rallies of the Co-operative Department we ask our agricultural officers to go to these rallies and deliver lectures and try to use some scheme for propaganda work. When you have an audience of any kind which is being addressed on agricultural matters, that audience can be addressed on co-operative matters and *vice versa*. Under the scheme that I wish to push through, namely, demonstration lorries and making demonstration work more popular, those things will be at the disposal of the Co-operative Department just as they are at the disposal of the Agricultural Department.

27652. I wanted to ask you a point regarding these lorries. Are they going to be used as travelling cinemas?—Yes.

27653. Who is to prepare the films?—It all depends whether they are full-sized films or smaller films. If they are full-sized films, we shall have to draw on professional film-makers. The G. I. P. Railway has been making a certain number of films under our direction showing, for instance, cotton, animal husbandry and various things of that sort. They have been doing it in other parts of India also. I understand they would be willing to let us have copies of these films on specially favourable terms.

27654. Do you think that their technical staff is sufficiently good for your purposes?—I realise that is a very highly technical business.

27655. Have you seen the films prepared by the G. I. P. Railway?—I have not seen them yet; they are bringing them up to Nagpur in a day or two.

27656. Would you agree that a bad film, although very expensive, is quite useless?—Yes.

27657. Would you agree that the production of films for propaganda work is a highly technical business?—It is. The films that have been produced in the Central Provinces have been produced in conjunction with the officers of the Agricultural Department. They are just being completed.

27658. Talking about demonstration and propaganda, do you think that there is an increasing demand by the cultivator himself for the services of the Agricultural Department?—I do.

27659. Is he beginning to take his problem for solution to the Agricultural Department?—He is beginning to seek the assistance of the Agricultural Department. It is rather difficult for him sometimes to clearly define what his problem is.

27660. In answer to Question 13 (i) on page 30, you set down the view that the arrangements for preventing the introduction of dangerous plant pests into India might be more effective and you cite an instance from your own personal knowledge where live insects in a consignment of plants from abroad were discovered by yourself after those plants had been subjected to disinfection and so on. What insects were they?—They were caterpillars.

27661. They were not Indian caterpillars?—Presumably not. They were in the plants themselves, all wrapped up. I do not think Indian caterpillars could have got into them. I do not think the material was opened up for disinfection. It struck me that the thing was not disinfected at all.

27662. I understand that an Indian goods train affords ample opportunities for caterpillars to climb aboard?—These particular plants arrived apparently in the state in which they were packed up.

27663. Do you suggest that on the recommendation of the Director of Agriculture specimens should be allowed in without further investigation or fumigation?—Yes. He will have technical staff to examine them at once when they come in and they will be examined both from the mycological and entomological point of view.

27664. Do you think that Provinces intermediate between the port of entry and the Province in question might have a word to say on that? Do you not think it is an important point because after all the principle of Imperial responsibility for the prevention of crop pests and other agricultural pests is well established in this country, and indeed in many other countries where, either under a federal system or a system akin to federal systems, the Central Government's responsibility for these matters has been recognised?—I would welcome any system that was efficient and short, but it is clearly no good importing plants when they take so long to reach us.

27665. Have you water-hyacinth in the Province?—Very little.

27666. I see that you say that water-hyacinth should be a notifiable pest and that its destruction should be made compulsory. On whom should it be made compulsory?—On the person in whose area it is growing.

27667. Have you been to Bengal lately?—No.

27668. If you had been there you would agree that the life of the cultivator would be very busy if you laid upon him this responsibility?—I know that water-hyacinth has become a pest in some places.

27669. Have you anything to say on the problem of veterinary teaching?—No.

27670. Have you anything to say on the question whether District Boards should or should not continue to be responsible for the veterinary service in their districts?—I have nothing to say on the subject.

27671. Looking at your answer on page 31 to our Question 16 (*a*) (ii) on Animal Husbandry, is dairying in this Province under the Deputy Director in charge of Animal Husbandry?—Yes, except at the Agricultural College, which is directly under the Principal of the Agricultural College.

27672. Take the supply of milk for the urban centres; how is Nagpur provided with milk?—It is largely provided by *gowalas*, but we have one co-operative dairy there which supplies a certain amount of milk.

27673. Is the milk at Nagpur supplied from buffaloes or cows?—Mainly from buffaloes; the buffalo is the chief milch animal; of course, there is a good deal of prejudice against the use of buffalo milk in certain cases.

27674. Is there a prejudice amongst Indians against buffalo milk?—In many cases the milk of the cow is preferred, buffalo milk being reserved for the *ghi*-making industry.

27675. Is it not rather because buffalo milk provides better *ghi* for cooking purposes?—I think that is it; it provides more fat.

27676. Are there any cross-bred herds, cross-bred between Indian and European breeds, providing milk for Nagpur?—The Telinkheri farm has a herd of Montgomery cattle; at the College dairy we have a number of cross-breds, but apart from Nagpur itself there is very little going on in dairying.

27677. Does the co-operative organisation that you mentioned a moment ago have a pure Indian herd; and if not, what breeds does it possess?—It has a pure Indian herd, and a herd of buffaloes. We supply breeding bulls from the Montgomery herd.

27678. Do they actually own the cows that produce the milk?—Yes; the individual member of the association owns his own cows.

27679. Do you regard the problem of the improvement of cattle in this Province as one of the major problems before you?—I think so; that is why we have a man on special duty for it.

27680. How long has he been on special duty?—About four years.

27681. We have been provided with a monograph of all that you are doing on the subject of improving the breeds, and the officer responsible for cattle-breeding will no doubt appear before us; I think he is coming before us as a witness?—No; he will be there, when you visit the farm under his charge.

27682. Is he also charged with the problem of improving the food supply of the cattle?—He is concerned with the growing of fodder crops and the trials of fodder crops; I have recently also put a certain amount of work of that kind under the Second Economic Botanist, who is dealing with grasses.

27683. What hope do you think there is of persuading cultivators to grow these fodder crops if you could work them out and recommend a particular grass?—I think, if the proposition is economically sound, one has every hope of getting the cultivator to take it up.

27684. Do you yourself think that silage offers good hope as a partial solution of the problem?—Silage is a problem which wants very careful investigation. It is not easy to convince people that to cut a crop of *juar* green and put it in a silo is a better proposition than allowing the crop to ripen and providing the grain for human consumption and the dry stalk for the cattle.

27685. You think that both the economic and the technical side require very careful investigation?—It is not a thing which one can recommend off-hand for general adoption.

27686. You do not think that enough work has been done on it?—No.

27687. Do the cultivators in this Province to any considerable extent consume dairy produce provided by their own animals?—Yes.

27688. They drink milk?—Yes, when they can get it.

27689. They consume *ghi*?—Yes.

27690. On the whole, would you say that physically they are well developed and healthy?—In certain tracts, they are fairly well developed.

27691. Do you associate the consumption of dairy produce with those districts in which their physical condition is the best?—I should say that the people are better developed where the general standard of living is high.

27692. And the consumption of dairy produce is usually high where the standard of living is high?—I should say so.

27693. The poorer peasant is sometimes compelled to market his milk?—Frequently, he has no milk to market.

27694. *Prof. Gangulee:* In which tract is the standard of living higher?—In the Berar tract, the cotton tract, where there is more money.

27695. *The Chairman:* Have you considered the proposal to remit the revenue or part of the revenue on land used for growing fodder crops?—I do not think that has been considered; as far as I am concerned, the proposition has never come up.

27696. Do you know anything about hydro-electric surveys in this Province?—I think the Irrigation Department will supply a note on that; I do not believe it was ever considered to be a favourable Province for the development of hydro-electric works.

27697. You are doing a certain amount of research work on vegetable and fruit growing?—Yes, but that is a line which has come under reduction. At one time we had a European gardener, but the post has been abolished and really now it is part-time work.

27698. One has not only to grow the fruits, but also to sell them; how about the markets? Have they been studied at all?—Do you mean the co-operative marketing of fruits?

27699. No, the markets themselves, selling the fruit through co-operative organisations or in the ordinary way. What about the demand?—The demand for fruits and vegetables is very considerable.

27700. Is that for tropical fruit?—Yes.

27701. Have you any area in which you can grow temperate fruit?—Not on a successful scale; we have a very big demand for tropical fruit.

27702. Who is in charge of lac culture?—The Forest Department.

27703. Is it within your knowledge whether they have taken an active interest in it?—Yes, they have. I have a sort of general knowledge of what goes on. For instance, when the Director of Agriculture, Bengal, wanted me to supply him with seed lac, I was able to put him in touch with the people who could meet his requirements; that is the only sort of knowledge we have.

27704. I observe that you attach importance to economic surveys of particular villages as a preliminary to framing a policy?—Yes; it is very hard to add that work on to the ordinary duties of the Deputy Director of Agriculture.

27705. Have you anything to say about the possibility of developing the panchayat in the villages in this Province?—So far as agriculture is concerned, I think local agricultural associations would do that better than panchayat.

27706. That is your local association?—The sub-circle association is the local association.

27707. You have nothing in the nature of Taluka Associations?—We have the Taluka Association; we have the District Association and under that we have Taluka Association, and under that we have the sub-circle association.

27708. The District Association is the largest?—Yes.

27709. And which comes next to that?—The Taluka Association, which supplies a few members to the District Association, and under that we have the sub-circle association. We can eventually, when the importance of such associations is established, get down to the village association.

27710. What is the smallest official or semi-official administrative body in the Province?—The Tahsildar in charge of the tahsil; we have below him the Revenue Inspector.

27711. Which is the smallest corporate administrative body?—I suppose one would call the panchayat the smallest.

27712. Is the panchayat established under a particular Act?—I think Mr. Wills will be able to give you better information on the point.

Mr. Wills: There is a Panchayat Act, giving them power to tax themselves. The panchayat is constituted for administrative purposes, and they have a certain amount of judicial power.

27713. *The Chairman:* You have nothing in connection with agriculture?—We do not go down as far as the panchayat. With Agricultural Associations, a group of villages is the smallest unit we have at present.

27714. You have provided us with a note on the consolidation of holdings?—I think that is Mr. Dyer's note.

27715. Would you rather not speak to it?—Not, except in a general way; as a department we are not actually concerned with the consolidation of holdings.

27716. Agriculturally, you attach importance to consolidation?—Yes.

27717. Would you agree that the village being the unit for consolidation, the panchayat might have a very important agricultural bearing?—I would; we are interested in the consolidation of holdings in a similar way to the Irrigation Department, that is, for the improvement of irrigation or agriculture, but it is never carried out under the organisation of the Agricultural Department.

27718. Are you satisfied with the touch between yourself and the head of the Forest Department?—Yes. I should like to emphasise the fact that the forests should, I think, be utilised for definite agricultural purposes where feasible schemes can be put forward. For instance, in the starting of cattle-breeding schemes, if a forest area is required for a cattle-breeding farm, it will do more good to the cultivators as a whole than if that area, which may amount to 2 or 3 square miles, is reserved entirely for the supply of timber and grass.

27719. How about the production of dry fodder or hay from the Forest Department? Do you think more might be done in that direction?—I think so, provided the supply is available within reasonable distance.

27720. Or, I suppose, within reasonable distance of a good distributing centre?—Yes; but the supply of dry grass would scarcely be extensive, on account of the overhead charges for rural distribution.

27721. Not even in times of fodder famine?—In times of fodder famine the position changes; that is why one wants, as I have suggested, the storing up of grass.

27722. Is there any reserve of fodder against a fodder famine at the moment controlled by you?—No.

27723. Would you like to see that established?—I should like to see it established, but I do not think it necessarily need be controlled by the Agricultural Department, because the Agricultural Department is not very closely concerned with it; in times of fodder scarcity, the revenue authority takes it up.

27724. I should have thought that few things touch the interests of the Agricultural Department more closely than preserving the life of the cultivators' cattle in times of fodder famine?—The Agricultural Department is concerned with it; but it touches the revenue officer very closely too, and also the forest officer. It might be necessary to bring it under the Agricultural Department if it was not looked after very carefully by the revenue officer.

27725. Do you think that young officers of the Forest Department have a sufficiently sympathetic interest in the cultivators' problem?—Yes, I think so. What we have been doing in recent years in Nagpur is to have young officers of various departments (the forest officer did not come, I think) together, during the rains, for a course of lectures on the general outlines of rural economy, and some of the lectures have been given by agricultural officers.

27726. What do you say to a scheme of attaching young forest officers to the Agricultural Department and placing them in districts where cultivation is contiguous to forest areas for a short period?—I do not think that would be necessary provided he was in close touch with the local agricultural officer.

27727. Do you not think that such a scheme might bring in a more understanding attitude on the part of the forest officer?—I think if he is in close touch with the agricultural officer he will pick up the information he requires.

27728. Do you see anything against the scheme?—No; I do not see anything against the scheme.

Sir Henry Lawrence: Are the officers who attend these lectures officers of the Revenue Department?—Mostly of the Revenue Department.

27729. Provincial or Imperial?—Some Provincial and some Imperial; the lectures are given by agricultural officers, veterinary officers, forest officers, irrigation officers and it is a revenue officer, the Commissioner of Settlements, who conducts the courses.

27730. *The Chairman:* Do you think there is much prospect of encouraging cultivators to plant shrubs or trees for their future requirements?—I am afraid it will be difficult to get the cultivator to do it.

27731. Difficulty not only of planting but also of protection during the young stage?—Yes; even if one man brings them up carefully another man may destroy them.

27732. I understand that the memorandum on marketing which you promised in answer to Question 20 (*a*), (*b*) and (*c*) is not yet forthcoming?—I find some material that you have in this memorandum was taken out of it; but there is a good deal more which has still to be digested and I hope to let you have that before you leave Nagpur. Of course it does not touch cotton marketing; that has been dealt with specially by the cotton people.

27733. Turning to page 10 of the Provincial Memorandum (page 3 above) have you studied the control of the cotton markets?—I have seen a good deal of it while I was Deputy Director of the Western Circle.

27734. Do you think they are satisfactory?—In theory, but not in practice.

27735. I understand there has been recently a committee of the Indian Central Cotton Committee enquiring into the working of these cotton markets, which committee has not yet reported; is that so?—I have not yet seen any final findings. The question, I know, is still under consideration.

27736. Have you ever heard the charge levelled against these markets that it is possible for cotton to pass through the market and to be sold subsequently?—I have seen cotton being passed straight through the market without any business being done. Cotton passes from one gate to the other, while the business with regard to its sale is transacted at some other place entirely away from the market.

27737. That is even a simpler process than the one I was trying to describe. I thought they had a sham sale in the market and a real sale elsewhere?—No.

27738. Why do they bother to send it through and pay the fee?—I could not say why; under the market rules perhaps it has to pass through the market.

27739. Probably we had better wait till we get the report of that committee?—Yes.

27740. Have you ever considered the advisability of recommending the licensing of commission agents?—That is a matter for local self-governing bodies.

27741. You have no views on that point?—I think they certainly should be licensed. These commission agents should be brought under very careful control.

27742. I do not know who prepared this note on marketing in the memorandum which was sent us by the Provincial Government. On page 11 (page 3 above) it is stated: "The results of this inquiry (that is, the inquiry by the Indian Central Cotton Committee) have not yet been published but they indicate that a strict application of the rules to govern these markets will be necessary to prevent a good deal of the fraud at present practised on the seller". Have you any information on the point?—The inquiry was started before I went on leave and since I came back I have not seen the full account of it. I believe the full reports are still with the Cotton Committee.

27743. I understand that you yourself do not feel satisfied that the practice is quite as good as the theory? That is really the trouble.

27744. I do not know whether you would be prepared to answer questions in detail on the organisation of the Co-operative Department. Do you take a personal interest in it?—I am necessarily in touch with the Co-operative Department; but I would prefer not to go into details until you have examined the Registrar of Co-operative Societies.

27745. One or two general questions. Are you satisfied with the organisation of the Co-operative Department?—I have said in my written evidence, I think, that it requires a whole-time officer with special training.

27746. Where do you suggest that special training should be given?—I cannot suggest anywhere.

27747. You have not thought it out?—No.

27748. *Sir James MacKenna:* Have you not got a whole-time officer now?—He is the Registrar of Co-operative Societies, Director of Industries, and has two or three other functions also, such as the controlling of Boiler Inspectors and so on.

27749. *The Chairman:* Do you regard co-operative credit societies as the most helpful agent for solving the problem of rural indebtedness as it exists at present?—I think it is one of them.

27750. I understand that the experience of the Province in the matter of co-operation has not been without its disappointments?—No; there had been severe disappointments and even so it is one of the most helpful agents. I think alternative schemes might be developed that could be put in the hands of men who could make a study of the subject.

27751. In answer to our Question 23 (*a*), you are talking about the existing systems of education and you say they are not such as to induce the middle classes to return to the land. Should not the first problem be to discover an educational system which would keep the cultivating classes on the land?—You mean the present system?

27752. Are you satisfied that the present system, if it is developed, will succeed in educating the present cultivating class without inducing it to leave the land, a more important matter than that of inducing the middle classes to turn to it?—I do not see any sign that the present system will induce the people to return to the land.

27753. Do you see any signs that the existing system might disturb the cultivators and induce their educated sons to leave the land?—I think there is always the tendency for an educated man to seek employment away from the land.

27754. Have you any suggestions in the matter of general education which you have not set down in your note?—No.

27755. Would you attach great importance to an improvement in the drinking water-supply of villages?—I think there are tracts of country in the Central Provinces where the drinking water-supply needs to be carefully investigated. In fact it is so important a thing that I consider that it needs a special officer.

27756. Do you see any hope of financing the improvement of the drinking water-supply in these rural tracts which you are speaking of?—I think it is one of the items which should be financed with the general improvement of rural areas, communication of roads and so on.

27757. It is mentioned by one correspondent that a perusal of the last two or three Settlement Reports will show how much land has passed from the tenants to their malguzar as a result of the operations of debt; do you agree with that?—I do not think there is a tendency for the land to pass into the hands of the malguzar.

27758. Does that mean that the cultivating class ceases to cultivate or do they continue to cultivate on a new footing?—They cultivate on a new footing.

27759. Have you any idea of the extent to which the movement in question is going on, the alienation of the land from the cultivating classes to the malguzar?—No; but that information could be obtained from the Settlement Department.

27760. Do you happen to know whether it was ever been extracted from the Settlement Reports?—Not that I know of.

27761. Now, in attempting to solve the problem of improving the lot of the cultivator in this Province, would you rather see a concentration of means and expenditure of money on one or two specific points such as education, technique of tillage and the like, or a steady attempt made to advance all along the line?—I should like to see a concentration on education, agriculture and rural sanitation and health.

27762. Interpreting each of those headings in their widest sense, of course that is coming pretty near an approach all along the line?—Yes, it is.

27763. *The Raja of Parlakimedi:* There is a large area of paddy in this Province, is there not?—Yes.

27764. What are the popular fertilisers used by the cultivators?—One may say that no important fertilisers are used at all; cattle-dung is used where it is available, but there is not much manure used at all.

27765. Is the department doing anything in the way of teaching the ryots the use of fertilisers?—We carry out experiments on our own farm on such things as the use of *sann* hemp, bonemeal, leaves and things of that sort.

27766. Do you also arrange for the sale of green manure seeds to the ryots?—*Sann* hemp is the only green manure which we advocate, and there is already an established market for that seed. Of course, if a man wishes us to obtain seed for him, we would make every arrangement in the same way as we would obtain other seed for him.

27767. Is it becoming popular with the ryots?—I am afraid it is not developing very quickly.

27768. Do you think it would improve if there were many more demonstrators?—I think it would. All items of propaganda would be more successful if we could concentrate our demonstration; our demonstrations at present are too diffuse; we have not quite enough men; a man visits a village too infrequently to make his impression felt.

27769. What is the area under irrigation as compared with the area rain-fed in the whole of the paddy-growing tract?—We could obtain that information for you.

27770. Are there double cropping areas or only single cropping?—Double cropping is common but not universal; for instance, in the area round here you will see here and there fields lying in advantageous position which carry a second crop, but on the higher lying tracts there is only a single crop; the rice is not followed by any other crop.

27771. Is paddy grown as a double crop?—No, the paddy is grown as a single crop, but there are other crops in favourable positions where a double crop is grown.

27772. As a catch crop?—Yes.

27773. Are any of the Coimbatore varieties of sugarcane popular in this part?—They are becoming popular

27774. What sort particularly?—210 is perhaps the most popular, 219, and we hope perhaps 237 and 242.

27775. Have you any statistical information with which you could furnish us to indicate the increase in the use of the Coimbatore varieties up to the present?—We could obtain that for you; they have only recently been introduced into the Province, but we could find out the number of canes distributed.

27776. What is the state of the roads in the paddy tracts?—The main roads are quite good.

27777. Are they maintained by the District Boards?—In some cases by the District Boards and sometimes directly by the P. W. D.

27778. What is the state of the village roads?—There is not much trouble about village roads over the higher lying laterite soils; the village roads are not particularly bad.

27779. What is the nearest outside market for your Province for paddy?—Some goes to Jubbulpore, which is an inside market, and the rest goes to Calcutta, the paddy area being in the east of the Province.

27780. Is any attempt being made to introduce improvements in that area?—Yes.

27781. What are the improvements?—The chief improvement is the introduction of light iron ploughs, the Meston, the Monsoon, and so on.

27782. *Prof. Gangulee:* What is the inversion plough of which you speak?—The turn-wrest plough or the Monsoon plough, the Sabul plough; we have not any particular plough which we call the inversion plough.

27783. What particular plough have you introduced?—The plough we have introduced on the larger scale is the turn-wrest plough.

27784. *The Raja of Parlakimedi:* What facilities are provided to enable the ryots to get these ploughs?—*Taccavi* is issued very freely.

27785. Where are the depôts to which the ryot has to go?—On Government farms; there is one depôt at Raipur. All the main Government farms have a depôt.

27786. At what distances are these depôts found? Are they fairly well distributed in the paddy area?—Yes, and there are some sub-depôts too.

27787. May I know the number?—I could supply you with the actual number of depôts, but as a general rule one might say that the depôts are within easy reach; any cultivator can fairly easily get a plough; we try to make the depôts as widely distributed as possible, and we encourage Agricultural Associations to keep depôts for ploughs so as to get them out as far as possible to all the villages.

27788. Do the cultivators experience any difficulty at all in securing parts of the implements?—Not of the common implements; these depôts where the ploughs are sold also keep spare parts.

27789. Can the ryot get the parts of wood that are necessary?—He can get those from the local jungle.

27790. Is there any restriction enforced upon the ryot as to getting a supply of timber?—No, not of any importance; he can get the timber all right; there is no trouble about the timber.

27791. Is it by application, or what is the procedure he has to adopt?—He can get timber, it is available quite easily everywhere; he could get it from the malguzari area. The amount of timber he wants is so slight that there would be no difficulty in his getting it. You are referring now, of course, to green timber, not dry.

27792. Fairly seasoned timber?—Yes, seasoned timber for implement making; there is no trouble about that.

27793. Of course, that means he has to get some superior varieties?—Yes, one of the timbers suitable.

27794. What steps are being taken by the department to improve the cattle?—In the Chhattisgarh area that was dealt with in detail in this scheme under the heading, Eastern Circle, you will see that it is proposed to convert the small cattle farms into stock depôts, thus adding to the size and productive ability of the farms; and in addition we propose to open a cattle-breeding farm for the tract on a big scale at Pendra. That is referred to in the statement at the end; that is the cattle-breeding scheme, the amalgamation of the three existing herds into one big herd and the development of the present depôts.

27795. Do you think it will be sufficient for the area?—I do not, but it is a good deal better than anything we have at present.

27796. Do you intend to cross-breed or go by selection?—A combination of the two, cross-breeding and selection.

27797. Is it for dual purpose?—Largely.

27798. Are there any recognised cattle-breeders in this Province?—Yes, regular professional cattle-breeders.

27799. Are there any strains notable for milk?—No, not in this Province.

27800. Is it mainly for draught purposes then?—Yes, mainly; and then, of course, there are a good many buffaloes also brought into the Province from outside.

27801. Are there large orchards in this Province?—No, the orange is the only important fruit industry; the mango is to a certain extent important, and the guava in places; those are the three local fruits of any importance.

27802. Do not mangoes do well in this soil?—Fairly well, yes; the orange, the mango and the guava are our three main fruits.

27803. Is the department taking any interest in the protection of mango crops, that is to say, to combat the mango blight and that sort of disease?—We are not troubled to any great extent with that disease.

27804. In certain areas the whole crop fails if they have such an attack?—Frequently the crop fails to set fruit owing to unfavourable conditions at the time of the flowering of the tree; that is the greatest trouble, and the loss due to storms when the fruit is on the tree; both those things are uncontrollable.

27805. You are not troubled by this disease?—No, not to any great extent.

27806. There are large tracts of uncultivated land in this Province, are there not?—There are large tracts under jungle of sorts, some of which is cultivable and some of which is uncultivable.

27807. Would not it pay to offer those lands for agriculturally qualified men to settle?—I think if there were any demand from agriculturally qualified men that land might be given out to them on ryotwari tenure.

27808. The Province is rather thinly populated?—Yes.

27809. And can take in outside population, can it not?—It could. I would rather see the present areas better cultivated than extend cultivation at a low standard over wider areas.

27810. What are the oil-seeds grown in this Province?—Linseed, sesamum and ground-nut are the three chief ones.

27811. Approximately what area do they comprise?—They are not by any means the major crops, although they are fairly important; linseed is an important crop.

27812. Are you not for increasing the growth of oil-seeds on dry lands?—Linseed is grown to a very large extent on dry land already and so is *til* (sesamum).

27813. Ground-nut?—We are hoping to develop that as an alternative crop to cotton in the cotton areas and also as a crop in areas of lighter soils.

27814. *Sir Ganga Ram:* You do not grow much rapeseed?—No; but mustard is a fairly important seed in this Province.

27815. *Sir Henry Lawrence:* What is the area under cultivation?—I could not give you the figures, but I should say it is increasing rapidly. It is not a crop at present which comes under the statistics, I could only give you our distribution of ground-nut seed.

27816. *The Raja of Parlakimedi:* As regards the export of oil-seeds, would you like to see the export of oil-seed done in the shape of oil rather than of the seed itself?—Yes, as I mentioned before I should like to see the oil-cakes retained in this Province.

27817. What are the cakes which are popular as cattle food here?—One cannot say that any particular cake is popular. We have had some difficulty to induce people to use cotton cake instead of cotton seed; and as for the other cakes, of course cakes like *til* and linseed in particular are quite popular for cattle feeding; we are popularising the use of cakes like *karanja*.

27818. *Dr. Hyder:* What is *karanja*?—It is an ever-green tree which grows in the jungle.

27819. *The Raja of Parlakimedi:* Is *karanja* seed used as cattle food?—No, more as a manure.

27820. It is a bitter seed, is it not?—Yes, but it is a very valuable manure. Castor cake of course is another one but that also is entirely a manure cake.

27821. *Sir Henry Lawrence:* Is *karanja* fairly common all over the Province?—Yes. It is a very good roadside or shade tree on soils that suit it.

27822. *The Raja of Parlakimedi:* You have a fair amount of sugarcane?—Not a great deal, as we used to have. The area under sugarcane has gone down in recent years.

27823. What was the reason for that?—Importation from other countries to a large extent. That was gone into by the Sugarcane Committee. It was largely due to imported sugar replacing the local product. We still have a big

demand for *gur* and although it is not one of our major crops we do devote a good deal of attention to sugarcane.

27824. What are the main irrigational sources of the Province?—Tanks, and schemes like the Mahanadi Tank and River Scheme.

27825. *Sir Ganga Ram:* Tanks above the ground or tanks dug?—Generally an embankment retaining water on an elevated area.

27826. *The Raja of Parlakimedi*: In the rural areas, have you had any complaints from the ryots as regards irrigational facilities from the sources?—There are frequent complaints arising from the agricultural officers with regard to the supply of water and so on. We look into these things and try to set them right as far as possible.

27827. Do you frequently have opportunities of meeting the irrigational officers and discussing matter with them?—I meet the Chief Engineer, Irrigation, very frequently.

27828. How does he take your advice in such matters?—We discuss a lot of problems quite informally. If he wants anything done in the department he asks if I can do it and we manage it all right. Only two or three days ago, he was confronted with a problem with regard to a tank in the north of the Province. We discussed that and I took action to get the Deputy Director of Agriculture to follow a certain line which he (the Chief Engineer) wanted laid down. Then again the Chief Engineer sends me on papers from his office to see, and writes for information when necessary.

27829. You do not disagree upon many points?—Not often. I mean there is non-opposition between the two departments. Perhaps you might ask Colonel Pollard-Lowsley for his views on the subject?

The Chairman: We will.

27830. *The Raja of Parlakimedi:* As regards the levy of a cess upon exports, would you not like to see that some portion of it went to the cultivator also as an encouragement for further growing?—As a bounty on acreage, do you mean?

27831. On the quality of the stuff turned out?—He will get his bounty on the outturn if he grows good quality stuff.

27832. You are going to levy a special cess for research work and so on. If a man has followed your methods of cultivation and also conducts intensive cultivation, do you not think some sort of recognition of that as a monetary present would encourage them further?—We hope the diffusion of such advice would lead to monetary advantage.

27833. Would you leave it at that?—Yes, I should leave it at that.

27834. *Sir James MacKenna:* In answer to the Chairman you hazarded the opinion that if the development of the provincial departments had been contemplated, Pusa probably would not have come into the scheme of agricutural development proposed by Lord Curzon in 1903 or 1904. Are you aware that in that Despatch the scheme of provincial expansion which has actually taken place was envisaged and suggested, and that even then Pusa was included in the scheme?—I was not aware of that.

27835. Would you have disagreed with Lord Curzon's Government if you had been a member of it with regard to this scheme?—No, because I have already pointed out that there is a need for some central organisation.

27836. The impression I got from your answer to the Chairman was that so far as the Provinces were concerned you had very few relations with Pusa and that you were not at all satisfied with the training given there?—I did not say I was not satisfied with it. I think in my own mind that probably an alternative system of training would lead to greater efficiency.

27837. Then what is the net substance of your remarks as relating to Pusa? Do you consider it unnecessary and that it should be closed?—No, I would not say that by any means, because I think there are also a good many men who need training in the Agricultural Departments who would be benefited by a training at Pusa, but I am not sure that Pusa could give at present the highest possible training which is necessary for some appointments. I think some men require rather a wider outlook than Pusa perhaps can give.

27838. I will take up that question later. Now with reference to detail. What kinds of wheat do you think have given the best yield in this Division?—In the Chhattisgarh Division some of the Pusa wheats have done quite well: but in the north of the Province they prefer their own locally produced wheats.

27839. Have many of the Assistants in your department been trained at Pusa?—At present we have three or four.

27840. In the past?—We had one man also trained but he left us. He will be giving evidence a little later on; he is now doing agriculture on his own.

27849. Where was your present Mycologist trained?—He was on the staff at Pusa.

27842. Have you got any assistance from Pusa in the matter of cattle-breeding?—From Pusa, including Bangalore?

27843. I do not mind, including the two?—We have had advice from them. But the present system of cattle-breeding as drawn up in this note has been so drawn without any reference to Pusa.

27844. Have you purchased any cattle from Pusa?—Yes, a certain number have been got from there and also from other parts of Northern India.

27845. What are your views on the training of Indians for the superior grades of the service now that the department is being Indianised? What do you think is the ideal for a man of the Superior Service?—I suppose the bulk of them must be trained in India and exceptional men, I think, should be sent for a wider training. There are already available in India quite a number of men who have been trained, some in India and some abroad, who are still looking for posts. But, as I say, the bulk of them will be trained in India and one wants to give them as wide a training as possible. Therefore I am not in favour of training a man entirely in a Province, because there again he only comes up against one person who is acquainted with his subject and that I think is one of the advantages of sending a man to Pusa. But, even there, if he is trained entirely in India, he only comes up against one or two men. That of course will be put right as time goes on. I think however that the bulk of the men for all the Agricultural Departments will have to be trained in India. Provincial training I must say is of the very greatest importance because the man has got to apply his knowledge in a certain Province. Pusa can only give him a wider outlook.

27846. What are your views on sending Indian students to Europe?—I should ordinarily send only exceptional cases, and for particular purposes. But I think you have at the present moment in India a considerable number of men who have undergone foreign training. I have had three such men.

27847. Coming to your memorandum, for the financing of the central agency you suggest a cess on exports. Have you considered the incidence of this assessment? How would it affect particular Provinces?—As between an export duty and an acreage cess, I have come to the conclusion that the tonnage incidence is preferable.

27848. But do you not think that would fall very inequitably. For instance, the cess rate on rice runs to 11 lakhs of rupees the bulk of which would be provided by one Province? Half the total collection would be provided by one Province. In the circumstances, do you not think that the acreage rate would be more equitable?—The acreage rate would fall heavily on Provinces where the acreage outturn was low.

27849. You need not assess it on revenue below a particular scale?—In any scheme for levying a cess, I see difficulty. On the acreage basis, unless you have a fluctuating rate, the man who grows only 600 lbs. an acre will pay the same amount as a man who grows 1,200 lbs. On the other hand, with an export duty a Province like Burma which is exporting the bulk of the rice would naturally hope to get from the funds available a large part of that money for research work on rice because it is one of its major problems.

27850. Does Burma rice come here a great deal?—Not a great deal because it is not the type of rice that people in this part of the country like.

27851. Would you recommend a larger proportion of this cess being earmarked for provincial work and a contribution of, say, 10 per cent being given to the Central Government?—I think the fact that a crop was an important one in a Province would make it necessary to give back to that Province a good deal of money for work on that crop. If the money could go back to the Province which raises the crop, it would be a better crop and schemes would be put up for work on that crop.

27852. I take it that you would not include cotton in your scheme?—Cotton is already provided for for the time being.

27853. With regard to veterinary research, I see you have some objections. You say that there is cramped accommodation owing to the fact that veterinary research is at present carried on under the same roof as agricultural research. Apart from that, have you any objection to the veterinary and agricultural laboratories working side by side?—It sometimes makes for economy. We house them together only when the Veterinary and the Agricultural Departments have been combined and have not been able to find an institution for themselves separately. It is a very important department and should have a properly organised institution.

27854. In reply to Question 2 (v) you say that "the affiliation of the Nagpur College to the University has been an accelerating factor in this direction". Do I interpret you aright when I say that there are no posts in any other branches of Government service open to agricultural graduates except in the Agricultural Department? That is to say, there are no posts earmarked for them?—There are no posts earmarked for the agricultural graduate but he can get into the revenue line.

27855. How do they appoint to that service? Is it by competitive examination?—No, by selection.

27856. So that the agricultural graduate's chance is probably not very good?—I do not think he has a good chance because he has been trained in a highly technical line and is not trained so much in general culture.

27857. *Prof. Gangulee:* Would you like to see certain posts reserved for them in the Revenue Department?—I should not press for that. I should, however, like to see agricultural graduates being given a trial for these posts and if they prove suitable, they should be given a further field.

27858. *Sir James MacKenna:* Do you think the Reforms have affected the agricultural interests of the Province? Is any interest taken in agricultural matters in the Council?—I think a very considerable interest is taken in the Council in agricultural matters and I think the Advisory Board on Agriculture is becoming more and more valuable.

27859. *The Chairman:* Do you associate that increase in interest to the coming into effect of the Reforms?—To a certain extent I do. I think the mere fact that agriculture is a Transferred subject has aroused a little more interest.

27860. *Sir James MacKenna:* You have not been adversely affected financially?—Our budget has been increasing. We do not get everything that we ask for but I cannot say that our budget has been badly cut down. In fact, year by year the budget has been increasing.

27861. *Prof. Gangulee:* Of the four tracts that you have in this Province, to which tract does your department devote most attention?—I should say probably the cotton tract. I say that because at the present time we have a Botanist who is working on cotton alone. That is the only crop that has a whole-time officer.

27862. You have devoted most attention to the cotton tract. Which is the principal crop of the Province?—Cotton is the most important crop from the ponit of view of acreage.

27863. What is the total area under rice?—It is about the same as cotton. These are the two big crops, but more attention has been devoted to cotton.

27864. In the Central Provinces, I find that 76.4 per cent of the total crop area is given over to rice, so your department has not paid adequate attention to rice?—We have never had more than one Deputy Director of Agriculture who was largely concerned with rice.

27865. Agricultural progress varies, of course, from tract to tract. Where do you find progress most developed and clearly defined?—First of all, in the cotton tract, then in the wheat tract and then in the rice tract. That is the order.

27866. I ask you a general question. If you were asked to name one of the many institutions that your department has made to the agriculture of

the Province, what would be your reply?—The introduction of improved seed of rice, cotton and wheat.

27867. These are the results of your local selection work?—Yes; to a certain extent we have had some of the Pusa wheats also.

27868. What about rice?—It is entirely local rice.

27869. Is it all local selection work, or have you had any hybridisation work also here?—We had to a certain extent hybridisation on cotton and wheat.

27870. What sort of assistance is the cultivator beginning to seek? You said just now in answer to a question from the Chairman that they were beginning to seek assistance?—They want assistance in the selection of implements in the sort of seed that would be useful to them, how to crop their land or advice on the subject of manuring.

27871. Is it widely known among the cultivators of the Province that the Agricultural Department gives them very good seed?—The reputation of the seed of the Agricultural Department is, I believe, high.

27872. What are the agencies through which you distribute this seed?—We distribute seed through the Seed Unions, seed farmers and bodies of that type.

27873. On page 7, of your memorandum you say that the "grain for seed is nearly all advanced by either the malguzar or the *sowcar*". Do I then understand that these malguzars and *sowcars* have access to your seed?—That has nothing to do with the departmental seed; it is concerned with private seed.

27874. The majority of cultivators obtain their seed from the malguzars and the *sowcars*: is that a fact?—They make their own arrangements for the seed; it has nothing to do with the departmental arrangements.

27875. So the grain for seed is nearly all advanced either by the malguzar or the *sowcar*?—Yes. That is their seed grain business.

27876. The cultivator looks to the malguzar or *sowcar* for the supply of seed?—Yes.

27877. I want to ask you whether these malguzars and *sowcars* have access to the departmental seeds?—They have no access to the departmental seeds, but there is no reason why a malguzar should not be a seed farmer and should be able to produce departmental seed.

27878. But is that the case?—He can do it; there is no reason why he should not. In fact, we do all that we can to enable the malguzar to grow our seeds.

27879. How do you control these seed farms?—They are directly under the control and advice of the district agricultural officers.

27880. Do you have any arrangement for testing the purity of the seed?—The seed farms are inspected during the growing season.

27881. Are they inspected by the Botanist?—Not by the Botanist because they are too many for him to go over. They are inspected by the trained Agricultural Assistant.

27882. Let us take the difference in yield between your seed and the seed grown by the ordinary cultivator?—In the case of which crop?

27883. Say, in the case of rice?—When you go to the Labandih farm you will find there a statement showing all this clearly. It depends on whether it is early rice or a medium rice.

27884. Is the difference sufficiently attractive?—There is a substantial difference.

27885. The difference is so much that it appeals to the cultivators?—Distinctly.

27886. Is the difference with regard to the quality?—Yes, and the superior quality is largely due to the fact that seed is pure seed.

27887. That quality is recognised in the market?—Yes.

27888. Does it get a better price?—Generally it does.

27889. Now, about your demonstration work. I think you have explained that the qualification of your demonstrators is that they have been trained by you in the Nagpur College. Am I right?—Yes, mostly they are trained there.

27890. What is the method you actually follow in your demonstration work?—The Agricultural Assistant tours for a considerable number of days every month and visits all leading agriculturists. He goes from village to village and advises them to take up certain improvements, deposits certain seeds and generally takes implements with him in a cart. The implements are worked and demonstrated on the man's land. If he is willing to take an implement, then arrangements are made for the advance of *taccavi* grant.

27891. You do not grow any crop on the cultivator's land?—We do not make the cultivator's land the demonstration plot: we have our own demonstration plots.

27892. You have got your demonstration plots, your experimental plots and you have your demonstration farms. What is the difference between a demonstration plot and a demonstration farm?—The demonstration plot is a temporary plot which is, as far as possible, about the size which the cultivator in that area would normally cultivate; it it farmed purely as a business proposition; there are no permanent buildings on it, and it is farmed as we recommend a man to farm in that particular area; it is carried on for 5 years, and then is closed.

27893. You keep a record of the cost of cultivation?—The cost of working that farm year by year is carefully kept and analysed.

27894. What is your demonstration farm?—It is a permanent farm; it is a seed farm really for the growing of big areas of improved seeds.

27895. It is entirely under the control of your department?—Yes, it has permanent buildings and it is a permanent place.

27896. In your experimental plots there is no demonstration?—In our experimental plots, we do grow of course the ordinary recommended varieties, the experimental farms do produce seed and do act as demonstration centres. In our demonstration farms, nominally there is no experimental work, but the varieties are tested side by side; they have a certain amount of experimental work also.

27897. You have provided us with a chart showing the nature of your organisation and I am afraid I have not been able to follow the chart quite clearly. I should like to ask you who is the connecting link between the *kamdar* and the higher authorities?—The Agricultural Assistant on demonstration duty. The latter is under the Extra-Assistant Director of Agriculture who is again under the Deputy Director of Agriculture.

27898. You have no occasion to supervise the work of the *kamdar*?—Not directly, but I see the *kamdars'* work.

27899. These demonstration areas are permanent?—The demonstration plots as a rule are for five years only. The demonstration farms are permanent with permanent buildings. Only the demonstration plots are temporary.

27900. What is the nature of the demonstrations you have been holding during the last few years?—The demonstration of implements, the demonstration of seed growing side by side with local seed and things of that kind.

27901. Also manure?—Not much of it. We have not got anything to distribute on an economic basis.

27902. So you have two things to recommend, the purity of the seed and secondly the implements?—And sometimes methods of cultivation, for instance, the sowing in lines instead of broadcasting in certain parts of the Province.

27903. Could you tell us the quantity of seed you produce in your seed farms?—I think it has been given in one of the statements provided.

27904. In your demonstration work, do you receive much assistance from the Revenue Inspectors or Tahsildars?—We go even further than that; we receive considerable assistance from the revenue officers. We have an Agricultural Assistant attached to the camp of either the Deputy Commissioner or the Assistant Commissioner or a revenue officer of that standard, and he goes round on tour with that revenue officer and takes advantage of the opportunity afforded by the gathering of people to attend the camp to carry on agricultural propaganda.

27905. I come now to the statement of the distribution of seed. The total quantity of seed distributed is 183 thousand maunds and the area sown with

improved seeds is something like 844 thousand acres. What percentage of the total seed requirements is supplied by your farms?—A very small proportion when one realises that there are 5 million acres of land under wheat and the same area under rice and 2 or 3 millions under other crops.

27906. With regard to such improvements as the practice of transplanting of rice which is distinctly an improved method, what do you find to be the chief obstacle to the introduction of that kind of practice?—For that particular practice the obstacle is simply the local economic conditions that prevail owing to the scarcity of labour and so on.

27907. So is it your view then that these fundamentally uneconomic conditions prevailing in certain parts must be improved before agricultural improvements can make any headway?—I am afraid it is rather arguing in a circle. I do not know how we could break the circle. Improvement in economic conditions would enable us to demonstrate agricultural improvements more easily; on the other hand improved agricultural implements would raise the economic life of the people.

27908. The point is, how to begin and where to begin?—Yes.

27909. Do you find illiteracy a serious handicap?—Yes, very serious.

27910. In which tracts do you find demonstration comparatively easy?—I think demonstration work is easier in the cotton tracts and as a result of that I may say that it is unnecessary for us to open Government demonstration plots in those tracts. I may also mention that in the rice tracts we get plots from people who are anxious to open demonstration farms of their own.

27911. With regard to the assistance that you receive in your demonstration work you have told us that there are District Associations, Taluk Associations and Circle Associations. Do these associations take enough initiative in the matter of agricultural improvement?—As a rule the smaller the association is and the closer it is in actual touch with the village, the more active it is. Of all the associations, the District Association is the least effective.

27912. Because it is much larger?—Because it is an association of people coming from a wider area.

27913. These are purely non-official agencies?—They are non-official in membership. But generally an official takes the place of the President. For instance, a revenue officer, say the Tahsildar, attends the Taluk Association as an *ex-officio* Chairman.

27914. These are of great assistance to you in your demonstration work?—Yes, particularly the small associations.

27915. You have got a Provincial Board of Agriculture, have you not?—Yes.

27916. What are the functions of that Board?—It is an Advisory Board to the Local Government, but it goes a little further than that because it has the power of criticising schemes placed before it.

27917. I want to ask you one or two questions with regard to your research if I may. Have you visited Pusa?—Yes.

27918. In what connection?—As a member of the Board of Agriculture. I have also attended the Sectional Conferences there.

27919. As a Director of the Agricultural Department here, have you been able to carry on any experiment yourself?—No.

27920. You are mostly engrossed in your administration work?—Quite so; I have no area directly under my own charge.

27921. You talk about the inadequacy of funds. What fundamental research work are you unable to undertake now owing to lack of funds?—We might take up botanical work. We find it necessary to have a whole-time Botanist for cotton; surely it is necessary to have a whole-time Botanist for rice.

27922. You have got two Economic Botanists already?—Yes; but the second one takes all crops except cotton and crops grown in rotation with cotton, he is also in charge of the teaching work of the Agricultural College and is also in charge of horticultural work; that is, he has to supervise 3 or 4 big public gardens in Nagpur. Now, on the analogy of the Education Department, a teaching post in an agricultural college is a whole-time post in itself. It is hard to

expect a man who is teaching in an agricultural college affiliated to the University standard to do the teaching work and at the same time to be an Economic Botanist for many of the most important crops of the Province.

27923. You get a certain amount of help from the Indian Central Cotton Committee; do you not?—Yes; we get a certain amount of money from them.

27924. The First Botanist is engaged in cotton work?—Yes.

27925. And the Second Botanist?—In general work; and it is peculiar that in this Province the Central Cotton Committee pays the cheaper man and employs the services of the expensive man. That is, they pay for the Second Botanist who has taken over some of the botanical work, while the First Botanist, who is the senior man, is entirely engaged on their work.

27926. What is the work of the Agricultural Chemist?—He supervises both the chemical work and the bacteriological work. He has also teaching work and experimental work which is largely in connection with soils. You will have an opportunity of inspecting that work at Nagpur.

27927. You think at the present time you have sufficient staff and laboratory equipment to carry on fundamental researches on soil and on plants?—I should like to see the scientific staff, such as the botanical staff and the chemical staff, increased so that there should be one man entirely for teaching work and one man for research work. I would not prevent the teaching man from doing research work because he would probably be interested in it. But I think this dual function occupies too much of the time of the scientific officers.

27928. When I talk about fundamental research what I mean is this. You have in agricultural research two distinct aspects, one dealing with fundamental problems and another dealing with minor questions arising from them. The point I should like to get from you is whether you think your staff and your equipment generally are adequate to carry on fundamental as well as minor research investigations?—At present I should say they are and if we continue to recruit men of the same standard as we have at present, I consider they are quite enough to carry on fundamental work.

27929. You would not like to see a central institute like that at Pusa to carry on the fundamental work?—I cannot quite see how a central institution at Pusa could carry on fundamental work in a Province.

27930. May I explain? Suppose you take the black cotton soil. As you know the whole of the black cotton, or the greater part of it, is deficient in nitrogen. Now that problem is not merely limited to a particular Province. Bombay is interested as much as you are interested so that that particular problem, the problem of nitrogen in black cotton soil, could be taken in hand by a central organisation?—But on the other hand the soils in the Raipur district here are equally deficient in nitrogen.

27931. That might be a provincial problem?—I see no reason for making the black cotton soil an Imeprial problem and the other a Provincial problem.

27932. The nature of the problem is such that it arises in more than one Province?—But the deficiency of nitrogen exists in all Provinces.

Therefore it is a fundamental question and ought to be tackled by the central organisation.

27933. In your own research work, did you come across a single problem, any specific research problem, which you would like to see tackled by an Imperial Institute such as the one at Pusa?—I cannot say that I did.

27934. We are often told there is a surplus cattle population in some of the Provinces; is that the case in this Province?—There are too many cattle of a type; there are too many inferior cattle and not enough good cattle.

27935. Are you trying to introduce some new varieties of fodder crops in this Province?—We have tried a good many varieties of crops, only some of which seem to be economical so far.

27936. Cassava?—We have grown cassava but it is not a crop which is very useful to this Province.

27937. The improvement of a crop, as you know, involves a number of factors; when you conduct your research, either in the laboratory or in your

experimental farms, do you attempt to bring into focus various factors?—Yes, we like to look at the problem from the point of view of all factors, whether it is mycological, bacteriological, chemical, botanical, and so on.

27938. You try to get sufficient data in order to understand the problem from all its aspects?—Yes; in fact I have a scheme now in view for subjecting all experimental work to an experimental board in the Province composed of officers of all sections.

27939. In Nagpur College you have a four-year course?—A four-year course and a two-year course.

27940. These advanced students are quite familiar with the nature of the work you are doing?—Yes, quite.

27941. I mean the fourth year students?—Yes, they should be; I have not done any active teaching lately, but when I was doing active teaching I took care to discuss things going on in the Province, and I believe students are now given an insight into what is going on in the Province.

27942. Is it not your practice to take your fourth year students to visit such stations as the Coimbatore sugarcane station?—No, but it is our practice to take them to visit the stations in the Province.

27943. Not the Imperial stations?—No, not on such long journeys as that.

27944. *Sir Ganga Ram:* You said that the Agricultural Engineer had resigned; do you propose to fill the vacancy or is it abolished?—No, it is not abolished, but we are now rather in a transition stage; the Imperial Agricultural Service is now abolished and we cannot fill posts of that type, so that the whole position with regard to posts which were formerly posts in the Imperial Agricultural Service has to be looked into.

27945. Now you will have to engage a man on Provincial Service?—On new terms.

27946. On Provincial Service?—Something of that kind, a special post.

27947. What salary does it carry?—We have not had any orders on that subject yet.

27948. What are the functions of the Agricultural Engineer?—He advises on plant, attends to repair, keeps an organisation for the erection of small power plant.

27949. At the Agricultural College?—He is in Nagpur, he has nothing to do with the Agricultural College.

27950. Does not he teach mechanics?—No, he does no teaching.

27951. Is not Agricultural Engineering taught as a subject in the college?—They have their own lecturer in Engineering.

27952. The man who lectures there is not an engineer?—He is an Engineer but not the Agricultural Engineer, in the same way that the Deputy Director in charge Animal Husbandry has no duty of lecturing on Animal Husbandry in the Agricultural College.

27953. Is this agricultural engineering under you?—Yes.

27954. Forgive me for asking, but have you any training in engineering?—Yes, I was under Professor Cawthorne-Unwin at one time.

27955. Who deals with well-boring?—At one time that was under the Agricultural Engineer, but the work is scarcely work that can be put upon an officer of that type without taking up far too much of his time; it has now been transferred to the Public Works Department.

27956. Has no boring been done?—A certain amount of boring was done in trap rock. It was such a difficult problem, that it took far too much of the Agricultural Engineer's time. It was too important a problem to make part-time work for an officer occupying the post of Agricultural Engineer. It is whole-time work, not part-time work.

27957. It is the proper function of the Agricultural Engineer, is it not?—I do not consider the supply of water for household purposes for villagers is his proper function.

27958. I am talking about water for agriculture?—That is another thing, but not boring for well water for household purposes.

27959. No, I am not referring to that. The reason why I ask you this question particularly is that I was told that in many cases the crops failed only for want of one watering. Is that so?—That is frequently the case; I do not say one watering would save the crop, but it would improve many crops at a critical time.

27960. Where is that one watering to come from except from the subsoil?—Or from tanks.

27961. I am coming to tanks very shortly. Anyhow, it comes from lifting water from tanks or wells, does not it?—Yes.

27962. Then lift irrigation comes in?—Lift irrigation is certainly a function of the Agricultural Engineer, and the deepening of wells, but it is scarcely necessary for him to undertake the deepening of wells, because that is a work well known to people in the Province.

27963. Do you go in for tube wells?—We have never done anything with tube wells; our geological conditions are not such that tube wells could be introduced.

27964. How do you know that? Has there been any investigation in that respect?—There is the Geological Survey, they surveyed a great deal of the Province.

27965. Part of this enormous quantity of rainfall that you get is used in irrigation; where does the rest go to?—Into the rivers.

27966. Floods?—Yes.

27967. Is there no kind of soil here which will take that water?—There are very few areas of deep alluvial soil here at all. The big problem is that where the rainfall is short, where we have a rainfall of say 20 to 30 inches, in those areas the underlying rock is very nearly all trap.

27968. What is it?—Basalt trap.

27969. Is it in strata?—Yes, with fissures, layers of trap rock of different ages overlying the water-bearing strata.

27970. And you cannot make wells in that?—You can make wells, but it is an extremely difficult and expensive matter, because to find the water in trap rock is a very uncertain thing.

27971. But do you not think it is better to give the people one watering from wells to save them from famine?—Yes, I agree, if you can get the wells it is a good thing.

27972. Do you not encourage the sinking of wells?—It is encouraged.

27973. What is the depth of the water from the surface of the ground?—It may be 70 feet, 50 feet, or it may be 100 feet. The depth to which you can sink a well in trap rock is an absolutely uncertain thing; you may sink a well in trap rock and get a small supply of water; with a view to improve it, you may sink deeper but all the water slips away through a fissure.

27974. Have you ever investigated to see whether the supply of water from a well can be augmented by the dynamite process?—By putting channels; that is sometimes done.

27975. Is it done here in this Province?—I believe so.

27976. But also sinking dynamite shafts and blowing them up?—Yes, that has been done too.

27977. Have you any report on that subject?—No, I do not think we have; our department has only just touched on well-boring for a short time; we had one or two well-boring plants, but it was only a part-time work for an officer who had a lot of other things to do, and it was handed over to the Public Works Department.

27978. When did you have a famine last? I know in 1899 there was a severe famine?—I have been out nearly 21 years and I do not remember a famine. We have had scarcity but I have never encountered a famine in the Central Provinces.

27979. To what do you attribute the fact that there are no famines now, whereas in the latter part of the nineteenth century they were very frequent?—

I think it is due to the fact that stores of food-grain outside the Province are now easily moved about inside the Province.

27980. Not that production has increased?—No, I should not say that; I think it is the improvement of communications, railways and roads.

27981. Have you not opened relief works since 1900?—A certain number of relief works have been opened at odd times of scarcity, but there has never been a famine such as there was in 1899. In 1907 there was scarcity in some parts of Berar.

27982. Did people come to the relief works?—Yes, I believe so.

27983. Relief works were opened, were they not?—I have seen famine relief works about, but I could not tell you off-hand to what extent they were utilised.

27984. You always aim at making tanks. Are these tanks fed by seepage of drainage water?—They are drainage tanks.

27985. Or are you only relying on the rain water?—The run-off from the catchment area.

27986. From higher areas?—Yes.

27987. What is the size of the biggest tank you have here?—The biggest tank I have personally seen is the Nawagaonbund which I believe is between 16 and 17 square miles.

27988. Is that artificial?—Yes.

27989. Have you got big retaining walls round it?—One very small *bund* about a quarter of a mile long.

27990. Then you have put it in the valley?—Yes, with hills around.

27991. You have introduced big tanks with big walls?—Yes, but those are built by the Irrigation Department; this is a tank which has been built by cultivators.

27992. In designing these tanks your aim always is to have them at such a height that you can take the water by flow; is not that so?—I am afraid that is the function of the Irrigation Department, not of the Director of Agriculture.

27993. You said something about Pusa. You have visited Pusa, have you not?—Frequently.

27994. Have you ever thought of some method of fixation of nitrogen from the air?—I have studied the various methods, yes; I have read a good deal about them.

27995. About nitrifying bacteria?—Yes.

27996. In Pusa did you see the laboratory where they have made that experiment?—I have not been to Pusa for two or three years, but I always go round the laboratory work when I go there.

27997. They have a very important method which is not only for provincial use but is for universal use; I was very much interested to see that; they show how nitrifying bacteria get their food from the green manure, and by constant harrowing and ploughing they breed and abstract nitrogen from the air; did you study that?—I have studied that and I have lectured on it too.

27998. Did you see the actual experiment at Pusa?—I have not been to Pusa for the last two or three years; I do not know whether that is a recent experiment.

27999. You said you preferred your own wheat to Pusa wheat; is your own wheat bearded or not?—We have various varieties, sometimes bearded and sometimes unbearded.

28000. Which do you prefer?—It is largely a question of whether birds and pigs are a nuisance; if birds are, we prefer the bearded sort.

28001. Have you seen the samples of the Punjab wheat?—We have tried the Punjab wheat.

28002. Which one?—Many varieties of Punjab wheat.

28003. Have you tried 8A?—You will be able to see that at Hoshangabad.

28004. Was it successful?—They are successful, but out of the large number

we try we endeavour to pick out the one which is most suited to our own conditions.

28005. While we are on the wheat question, I just want to ask you your opinion about one thing. You know in the London market Indian wheat is called dirty wheat; it contains 5 per cent of impurities. Do you think the zamindars are responsible for the impurity or are the exporters responsible?—I am afraid it gets in as a result of the usual agricultural methods of threshing, winnowing, harvesting and so on.

28006. The exporters do not do it?—I do not think so. One of our very great problems in introducing threshing machinery has been to overcome the dirt which clings to the straw due to the method by which the crop is harvested, that is to say, the harvester more or less cuts or pulls it off with the roots attached.

28007. Have you ever visited the Punjab?—No.

28008. You will see pure wheat there. I have actually sold for Rs. 5-12-0 and the people sold it to the exporters for Rs. 5-8-0. Where did their profit come from?—I can only imagine!

28009. You have no sugar mills here?—We have no central factories.

28010. They all make *gur*?—Yes; or sell the cane for chewing.

28011. Do they plant sugarcane after sugarcane?—Not as a rule; they take a rotation.

28012. What is the rotation?—Sometimes rice, sometimes garden crops; it is all in small areas. The biggest sugarcane growing district would not contain more than about 2,000 acres of sugarcane. It is a crop which is encouraged to bring money to the cultivator.

28013. What grows best after sugarcane?—Cotton grows best in the stubble of sugarcane. But some of our sugarcane-growing areas are not quite suited to cotton growing.

28014. Could you give me say three years' rotation of crops on particular areas?—That depends on the soil and rainfall. Here we can grow rice after sugarcane, or cotton or ground-nut.

28015. But what do you advise?—It depends, as I said, entirely on the locality.

28016. Supposing you had, say, 100 acres of land; I want to know the scientific rotation?—On light *sihar* (sandy soil) commanded by irrigation we might grow sugarcane, followed by cotton, followed by ground-nut.

28017. They do not make here anything between *gur* and sugar? Have you any indigenous method of making refined sugar?—No, nothing but *gur*.

28018. Have you made any research as to what delta of water you require to mature each crop irrespective of rainfall?—A number of experiments have been done both by the Irrigation Department and by the Agricultural Department in conjunction and we have arrived at a general idea of the quantities of water.

28019. Can you tell me what quantity of water is required for sugarcane?—That would depend upon whether it is black soil or light soil, but generally we give something in the nature of 30 irrigations.

28020. What delta depth?—It would amount to about an inch in depth per irrigation.

28021. That means 30 inches?—Yes; then it would depend upon whether the soil was a heavy soil or not. I can give you a statement for each of the different soils.

28022. Have you made any analysis of the soil to show what crop takes away what kind of chemical—I mean nitrogen and phosphates?—That was done a long time ago. There are some standard reports on that. They date from the time of Professor Church.

28023. Can you give me a copy of that report?—Do you want it to apply to the Central Provinces entirely?

28024. Well, we will draw our own conclusions here?—What I mean is this, whether you wish an analysis made of the ash of Central Provinces rice? The

Central Provinces soil is not homogeneous; it is hard soil as well as alluvial soil; it is a very interesting experiment. For instance, wheat takes away about 180 lbs. of nitrogen out of the crop.

The Chairman: That is per acre.

28025. *Sir Ganga Ram:* We have worked out all that. We worked out the loss of nitrogen. Could you kindly give me some data about that?—Yes.

28026. Cannot you make some use of this *kans* grass?—Not that I know of.

28027. Supposing you put it in the silos, would that not soften it enough to serve as fodder in times of famine?—It would not pay for the collection. We want to do away with *kans* grass altogether and introduce a better fodder.

28028. But in times of scarcity or famine anything would be useful. Have you made any research as to whether you can make it soft enough for the cattle to eat?—I am afraid the only experiments we have tried on *kans* grass are experiments to eliminate it altogether.

28029. But you have not succeeded there?—We hope to succeed.

28030. You know that in the Calcutta market three kinds of bonemeal are exported; one is the 3/16th mesh, one 3/32nd and one the steam burnt meal. Have you any experience of that?—Not much. The application of bonemeal has not proved a very economical form of manure.

28031. Then why do such enormous quantities go to England?—Because the conditions under which they are used are rather different there. We do use bonemeal in conjunction with green manure but it is not a thing which has been taken up on a very wide scale.

28032. As regards fuel in the Punjab, in the new colonies where cotton is grown cotton stalks are used as fuel all the year round. Does that happen here?—The collection of stalks from the field is one of the *haqs* of the cotton labourer.

28033. We do not depend on cowdung now; we use nothing but cotton stalks all the year round. Would it not be advisable to introduce that here?—They do use it in areas where cotton is grown, but in an area like this rice tract there is not enough cotton grown to produce enough cotton stalk.

28034. In the Punjab the Agricultural Department supplies pure seed at a very small profit to the people. They collect the pure seeds from such zamindars who take good care not to allow anything but pure seed and they buy them and sell them at a very small profit; it does not even pay the establishment. But they do take the place of the seedsmen. Are you aware of that?—I presume every Agricultural Department is a seedsman.

28035. But they buy seeds from us and then sell it sometimes even without any profit?—We do not buy but we arrange to grow good seeds to dispose of to the cultivators.

28036. You have said in your note that the *sowcar* or malguzar sells at 25 per cent more. That takes away 25 per cent from the pocket of the cultivator and therefore they would hesitate to sow improved seed? If you sell them improved seed at the same price as bazaar seed naturally they would buy it?—We sell our improved seed at the ordinary rates.

28037. But why should they pay 25 per cent more?—That is to the *sowcar*, to the man who is financing them; not to the Government. That is where the *bania* or the *sowcar* is combining his grain growing business with banking; that is his own seed.

28038. Who buys from you?—The main buyers are the various seed farmers. We can just about supply the various seed farms. In fact we could supply far more seed if we had seed farms. We do not deal with the buying business.

28039. *Prof. Gangulee:* Do malguzars grow any pure seed?—Yes.

28040. *Sir Ganga Ram:* What do the people do with ground-nut?—They eat it to a certain extent.

28041. Do they use ground-nut oil?—Yes, but it is not a very well known oil in this part of the Province.

28042. What kind of oil do the people consume here?—Generally *til* oil.

28043. You grow no rape seed at all?—No.

28044. It is a most useful leguminous crop?—*Til* and linseed are our main crops.

28045. Do you not think that the solution of the trouble of the people here who entirely depend on uncertain rains would be to encourage them to grow more fruit? You have got beautiful fruits, mangoes, Nagpur oranges and other things. Do not you think that fruit-growing ought to be encouraged here and yet you have gone and dismissed the Horticulturist?—I should only be too glad to get him back.

28046. Whose work was that?—I cannot say.

Sir S. M. Chitnavis: It was the work of the local Retrenchment Committee.

28047. *Sir Ganga Ram:* What I only want to know is whether the encouragement of fruit-growing would not bring money to the growers?—It would, but we cannot grow oranges extensively; that would be a very expensive business and would involve extensive facilities for irrigation. The irrigation is nearly always done from wells.

28048. But for mangoes, if you have a good rainfall, you do not want any irrigation?—When you start them you do require it, but as soon as the mango is well established it will look after itself.

28049. Mangoes in the United Provinces are a very profitable crop?—In the public gardens at Nagpur we have a big stock of mangoes.

28050. But I was talking of introducing fruit-growing all over the Province. Do you not encourage it?—Yes, we do. We make a special point of growing a large variety of well-used mangoes.

28051. With regard to lac cultivation, what tree have you found to carry the lac insect?—As a department we do not know much about lac cultivation. The Forest Department does that. The *palas* tree (the flame of the forest, as it is called) is a common one.

28052. Are you aware of any natural deposits which can be used as fertilisers?—No.

28053. Dr. Mann said that in the Central Provinces there was a large deposit of something which could be used as natural fertilisers?—I have studied the report of the Geological Survey of India pretty carefully on that point.

28054. Do you grow crops like potatoes and onions here?—Yes, we grow them as garden crops.

28055. Do you grow sufficient for the internal consumption or do you import them?—I do not think the amount of potato grown in the Province is sufficient, but the onion crop is one that the Indian cultivator does understand how to grow.

28056. Do you grow one crop or two? In the Punjab plains it matures in April and then it is of no use after October and therefore we have to import it?—The onion is a crop that will store well.

28057. *The Chairman:* Are onions very largely used?—Yes; we are also trying experiments in potato growing on the plateau area.

28058. *Sir Ganga Ram:* Have you made out any statement of imports and exports of food?—No.

28059. Are they ayailable anywhere in your Government?—I think you would find the particulars in the general statistics of export and import trade.

28060. That has been discontinued unfortunately. I thought you might have the provincial one?—As a matter of fact, statistics of that type are dealt with by the Director of Land Records and not by the Agricultural Department.

28061. *Mr. Calvert:* Do you know whether wheat and rice are exported from this Province overseas?—I think a good deal of wheat is exported overseas and a certain amount of rice too.

28062. Regarding this question of the affiliation of the Nagpur College to the University: have you got a Faculty of Agriculture and, if so, who is the Dean of that Faculty?—The Principal of the Agricultural College is the Dean of the Faculty of Agriculture.

28063. Are you a member of it?—I am not because I am the intermediary between the College of Agriculture and the Local Government and we thought that it was as well for me to be outside.

28064. Is the Faculty so manned as to insure the proper representation of agricultural views?—We have endeavoured to secure that.

28065. On page 3* of the original memorandum there are figures given for holdings. Do these holdings refer to holdings per individual cultivator?—This particular portion was not drawn up by the Agricultural Department; if you would like to have that information we can get it from the Director of Land Records; I think that is the average holding per cultivator.

28066. On page 7* you give certain reasons for the diminution in the area under wheat, one of which is the opening up in recent years of the great wheat fields of the Punjab. What is the argument there?—I presume the argument is that the Punjab could put wheat in the market at a cheaper rate. The Punjab outturn is better; our outturn is only 800 lbs. per acre.

28067. Is the idea that the production of wheat in the Punjab has lowered the prices internally?—Yes, that is the idea.

28068. Actually, we know that the price has been steadily increasing?—I was not responsible for this statement, and I am not quite sure what was at the back of the mind of the man who wrote it.

28069. With regard to the question of labour mentioned in paragraph 25 of your original memorandum (page 3 above), you say: "In all agricultural tracts there has been of recent years a distinct indication of a shortage of labour." This is a seasonal shortage, I presume?—It is a seasonal shortage coming at the time of the harvesting of the cotton crop. There has also been general shortage since 1919, although it is gradually being put right.

28070. Similarly, on page 13, paragraph 27 (page 4 above), you say: "There are areas of land commanded by irrigation which, because of labour shortage, are not utilised." In paragraph 31 (page 5 above), other reductions of labour are mentioned and at the end of the same paragraph quite a different point of view is put up. It is said that people are getting prosperous and can employ labour for themselves. Do you think the shortage of labour is partly due to laziness?—I think it is partly due to the fact that some people, at any rate when they become to a certain extent affluent, object to doing much manual work.

28071. The higher wages enable the men to subsist by working less time?—I think that can be taken as a great truth.

Mr. Wills: I may mention that during the influenza of 1919 this Province lost about 900,000 people.

28072. *Mr. Calvert:* What I am trying to get at is: to what is this shortage of labour due? Is it due to inefficiency of labour or to disinclination for work?—I think both factors come into it. There is a genuine shortage of labour and there is disinclination on the part of the people who can afford to pay somebody else to work for them.

28073. *Prof. Gangulee:* Is there any emigration from this Province to Assam and other parts of India?—Yes.

28074. *Mr. Calvert:* Actually you have land which is cultivable, but which is not being cultivated?—There is a certain amount of it; I should not say there was a great deal of it in the Province.

28075. It is quite a big area?—Yes.

28076. What I am driving at is the tendency of the working people, the cultivators and others, to limit their work to what will bring in a bare subsistence?—I think there is a tendency in that direction.

28077. In paragraph 85* you say, "It is intended that seed and demonstration farms should pay." May I know what should they pay?—That means that they should give a financial return.

28078. Do you think it is a sound policy to start a farm with one purpose and then try to make it serve quite a different purpose?—A demonstration farm is presumably a farm which is intended to demonstrate how to do the best cultivation in a

* Not reprinted.

certain area. We demonstrate there the most economical methods of cultivating a certain area in order to give a paying return.

28079. A farm demonstrating better cultivation will be quite differently organised from a farm demonstrating the financial results?—A good method, to my mind, is the one that gives good financial results. The demonstration farm should give a satisfactory financial return on the area.

28080. On a demonstration farm, would you not naturally stock a larger number of implements than you would on an economic farm?—On a demonstration farm we are not so much demonstrating the implements as demonstrating the farming of a certain holding and combining with that the business of seed production. It is necessary to have extra supervision in order to get your seed pure. You have sometimes a number of small plots which you sow differently and sometimes there is overlapping between experimental work and demonstration work and that is the reason why we make a demonstration plot entirely demonstrative and not experimental. Even then a certain amount of experimental work creeps into the demonstration farm. It is really a seed farm. The term "demonstration farm" is perhaps a bad expression because almost invariably they are over-capitalised in the matter of buildings. You have got big seed stores which the farm would not normally carry; and you have overhead charges.

28081. Actually, so far as I know, I have never seen any farm designed to yield financial results. They are proposing to have one in England?—I think a demonstration plot should essentially be a plot to demonstrate the economic method of farming that particular holding and we are particularly careful not to put up very pucca building on it and also not to tie up a lot of money in capital charges.

28082. In your demonstration work you seem to appeal to the bigger landowners. The phrase "bigger landowner" repeatedly occurs in that note. Do you think it is a sound policy?—I think it is because the bigger landholders are the more educated men, and it is easier to appeal to the educated man than to the illiterate man; if we can get hold of the bigger man, we can get hold of the smaller men also.

28083. You think the practice of the bigger man will filter down of the smaller man?—Yes, I think so.

28084. Is that justified by experience?—The bigger man is in a position to adopt any recommendation we make; he has a little more money behind him; the smaller man is not quite so easy to deal with.

28085. Has that been the experience in the immediate neighbourhood of your demonstration farms? Do you find your methods being copied?—Yes, I think so. I do not say that it is universal, but I do think there is a tendency to copy them.

28086. *Prof. Gangulee*: The bigger man is the malguzar?—He is the man holding a big area; he might be the malguzar, and generally he is a malguzar.

28087. *Mr. Calvert*: Do the landowners to whom you refer themselves cultivate any large areas?—Not always; there are a good many absentee landlords.

28088. On the question of wheat you say that the impracticability of manuring dry wheat has been proved; what is the difficulty with a rainfall of 45 inches?—The rainfall comes at a season when the wheat is not on the ground.

28089. Can you not conserve moisture?—It does not seem to be a very satisfactory practice to manure, in the rains, land on which you are going to grow wheat and you cannot manure it in the cold weather when the land is not receiving moisture in the form of rain. If you put it on, then the ground is not sufficiently moist for the manure to decompose. It has, I think, been accepted pretty generally that the manuring of unirrigated wheat does not appear to be a profitable proceeding.

28090. Even with cowdung:—Yes.

28091. Does the area covered by your improved seeds roughly work out to about 4 per cent of the total?—It is something like that.

28092. There is very large scope still for further propaganda?—Yes. One does see nowadays, evidences of the propaganda of the Agricultural Department, but I remember a time when, in spite of the free distribution of implements, it was unusual to come across instances where they were being used; one does come across them now

at railway stations and other places. Only during Christmas time, I was out in a district and I saw some people threshing their rice. When I asked them what sort of rice it was, they told me that it was Government *bhondu*. As far as I know, no active demonstration work is being carried on there.

28093. I gather that you do not make it the chief point in planning your demonstration schemes that your demonstrator should be an actual cultivator?—No, but we do all we possibly can to encourage the cultivating classes. We would rather have a demonstrator who belonged to the cultivating classes; it is almost essential now. With an increase in the number of students in the Agricultural College, we can ensure that the demonstrators employed in the future will be men with quite a strong agricultural connection.

28094. You say in another place that the visit of an Agricultural Assistant to a village has not been the event in village life which it should be; is it because you have not drawn the demonstrators from the cultivating classes?—To appeal to the village you must appeal to them by eye as well as by ear, and we have not given our Agricultural Assistants sufficient facilities for making a good show. I want to have something definitely like an agricultural show; there must be something to put before the people; it may be diagrams, pictures, implements, or something of the kind. Even an oil engine driving a pump, as long as it makes a good deal of noise, is always a centre of attraction.

28095. Do you think the cultivator will learn as willingly from a man above him in caste as from one of his own class?—I think the cultivator will learn from any man, if he realises that that man knows what he is talking about and he talks with enthusiasm.

28096. He does not have a caste prejudice?—No I do not think so. As long as that man can show, on the surface at any rate, that he really knows something about agriculture and he talks agriculture, I do not think it much matters what caste he belongs to.

28097. I see that you lay great stress on the enthusiasm of the demonstrator but you do not mention his sympathy. Do you not think that demonstrator requires to be a man in full sympathy with the rural classes?—I think that it is really good to have a demonstrator who will be in sympathy with the agriculturist; that goes without saying.

28098. You are not insisting on your Agricultural Assistants being agriculturists?—We have not insisted upon it. It has worked out like that in practice, but because a man is not an agriculturist, you cannot say that he is not enthusiastic about agriculture. He may have drifted into the Agricultural Department because there was no other department which he could enter. In future, I think we shall be able to make a much better selection of our Agricultural Assistants.

28099. You say that the father does not appreciate the value of agricultural training for his son. Is that on account of any defect in the curriculum?—No, I do not think so; I do not think it is any question of the curriculum. It is simply that the father himself has not yet, in most cases, appreciated the value of instruction in improved methods of agriculture; he does not understand it himself.

28100. But you are up against the curious fact that your agricultural training creates a very strong disinclination to put it into practice?—Yes; generally, one finds that the people turned out from an agricultural college will go and farm themselves if they cannot get a post. To actually put their knowledge into practice on their own land is really the second thing; the first thing is to get a post and advise somebody else to put his knowledge into practice.

28101. You do not think it is due to any defect in the curriculum?—No, I do not think so.

28102. Have you tried in this Province any co-operative societies specially for the improvement of farming, like better farming societies?—No, we have not.

28103. You wish the system of *taccavi* to be made simple and speedy; have you any particular suggestion to make how to secure simplicity and speed in the distribution of *taccavi*?—Yes, but I would not like to put it forward now. If there was a man on special duty to take this thing up, between us we might be able to work out a scheme It is a thing which I have discussed with Deputy Commissioners, how to make it easier and simpler.

28104. Every revenue officer in the country would like to see it more simple and speedy; it is a question of practical suggestions?—It is a thing with regard to which

one might work out a system. It has to be looked at from two points of view; the security must be safeguarded, and yet we should not hold to that security too tightly. In order to give *taccavi* quickly and when it is wanted, I think Government might take a few risks of losing the money occasionally, I think speed is the great thing.

28105. You do not happen to know whether the loss to the Province on account of the remissions of *taccavi* is at all heavy?—I do not think it is, but I could not say definitely without reference to the figures.

28106. You propose that a whole-time officer should take up the question of land mortgage banks; could it be done by the Agricultural Economist?—No, I do not think so. Of course, he would take up the question, but he would not have the running of such banks. He would have to formulate schemes on which these banks could be started, but he would not have the run of them afterwards. That would be the kind of work which the Agricultural Economist might take up to begin with, but as soon as it became a running scheme he would hand it on.

28107. I should like to have a clearer idea of this officer you propose for investigating underground supplies of water; would that officer be under you or under the Revenue Department?—It is so largely a question of domestic water-supply that I should be inclined to put him under the Public Works Department.

28108. Not under your department?—No.

28109. In one Province we find that the officer in charge of wells and borings is under the Industries Department; does that strike you as sound?—No, not particularly; he should be under the Agricultural Department or the Public Works Department boring for water is largely a question of the improvement of villages.

28110. Is this remark of yours, that the Province is not yet prepared for cattle-breeding societies, based on experience?—My idea in putting that remark in is that the whole conception of cattle-breeding is in such a backward condition in the Province that until we get further on, see our way, and get some decent herds of cattle started it would be premature to start cattle-breeding societies. You ought to be able to give to such a society some clear line on which they can proceed, and which will lead them in a safe and sound direction. Until we have a little bit more experience and turn out herds which are valued and which are suitable to the Province, I should not be inclined to launch on cattle-breeding societies.

28111. You are rather inclined to put economic investigations of villages under the Department of Agriculture?—Yes.

28112. Do you think the Department of Agriculture has sufficient men with a knowledge of rural economics to guide this investigation?—Yes, if we had a man appointed for the post. I see no other organisation in this Province to take it up. I think we are more closely concerned with rural economics than any other department in the Province.

28113. It is rather unkind of you to put this work on your department. You would not object to the system obtaining in the Punjab of having a non-official body with a Revenue Commissioner as the President?—Not a bit; if you could do it, that would be all right.

28114. I think if you had got to spread your improved varieties of seeds over 96 per cent of your area, that is quite sufficient in hand for you without undertaking these additional duties from the revenue side?—I rather doubt whether we should be willing to take them on, but there is no reason why they should not be. We are the department more than all others closely connected, and our work is so bound up with the economic position of the rural inhabitant, that I think it is one of the functions of this department to go into that question.

28115. You are directly under a Minister?—Yes.

28116. Between you and the Minister, who is your Secretary?—The Revenue Secretary.

28117. Is he a senior officer of Government?—Fairly senior.

28118. He deals with the different branches?—He deals with agriculture, co-operation and industries.

28119. Cattle-breeding?—It is not a separate thing.

28120. Veterinary?—Yes, it goes up to him separately.

Mr. Kamat: You gave certain answers about the Pusa Institute, stating your view with reference to the position of Pusa in the agricultural hierarchy of the country.

28121. I would like to ask you one or two questions about that point in order to clear up certain aspects of the problem. When Lord Curzon instituted Pusa probably he did not contemplate the coming of the Reforms. Under the Reforms now you have the Transferred Departments and so far as agriculture is concerned, the Provincial Governments can go ahead as they like; you agree?—Yes.

28122. Under the Lee Commission's arrangements they can also, if they choose to do so, recruit any technical expert independently of the Government of India?—Yes.

28123. You told us just now that so far as your Province is concerned, in the matter of rice and in the matter of cotton research at any rate, you received the particular lead from Pusa by which you could recognise the special value of the Pusa institute; that is also correct?—Yes, in the case of rice.

28124. Now, in the first place in view of the constitutional position which I have just now described and also in view of the actual experience of this Province which you admitted in this matter, I should like to ask you what should be the future policy of recruitment, if Pusa is to be maintained at a high level, I mean when the time for recruitment of special experts arrives? Should men be recruited who are of world wide reputation, who could really be of use to the Provinces, or should there be men who are practically of the same calibre as one may have in the Provinces?—I think the calibre of the men at Pusa should be above that of men in the Provinces.

28125. That ought to be the guiding principle unless Pusa is to be continued in the position of something like the fifth wheel to the coach?—It should be a central institution to which provincial institutions could look for something better than they have in themselves.

28126. And in our future policy of recruitment, should research officers in the Provinces who may have done exceptionally good work, say, in rice or cotton or sugarcane, or anything else, not be taken up for Pusa?—I should make the recruitment to Pusa a world wide thing, to get the best men you possibly could at the price you could offer.

28127. Can you attract such men at the present pay?—I do not know; I do not know if the appeal for recruits is made sufficiently world wide.

28128. But if your first principle is to be accepted, you would not mind any scale of pay?—Any scale of pay that will attract the men you want.

28129. Now with regard to another point; You know in the Provinces the post of Director of Agriculture is held, in many Provinces at any rate, by men who are scientific men at the present moment?—Yes.

28130. Now, speaking impersonally, will you kindly tell me which would be the better method, to have a Director of Agriculture who is an exceptionally good administrative officer, say, of the Indian Civil Service cadre, or to allow this post to be held by a man who ought to be really relieved for technical research work in the department? I mean if he is a Chemist, allow him to do research work in chemistry; if he is a Botanist, allow him to do research work in botany and so on instead of making him do the routine work?—Even if he is a Chemist or Botanist you want a man who has an all-round knowledge of the requirements of agriculture and therefore that man is not necessarily a bad administrative officer; he may be an officer who could get his colleagues to combine together, as well as an officer who is entirely administrative. At least there is one aspect of agriculture in which he has detailed knowledge, but a purely administrative officer has none.

28131. In other words, the Director of Agriculture should know pre-eminently rural economics rather than be a technical or scientific officer?—He should be in sympathy with all sides of agriculture.

28132. Almost every officer is in sympathy?—But the man who has specialised in rural economics may not have any sympathy at all with the Botanist or the Chemist and to think bacteriologically may be an absolute nuisance to him.

28133. Now about this scheme of yours for a central fund to help the Provincial Governments in the development of agriculture, you suggest a cess on certain crops which are exported. Do you mean that it should be a flat rate of 8 annas for all crops or should it be, for instance, a rate of Re. 1 per ton for wheat, 8 annas for rice and so on?—When I first worked it out, as a matter of fact I put it down as flat rate of Re. 1; but I thought it would be too much and I then put it down at annas 8. But this is only to give an idea of what I had in mind; it might be a variable rate; I should have a preferential scale, crops giving a large yield paying more and crops giving a smaller yield paying less.

28134. You agree that some sort of a scale would be desirable?—Yes; it should be on a moveable scale.

28135. On page 24 of your note regarding this grant to Provincial Governments from the Central Fund you say that once the grant is made to a Province, the Province should be given a free hand and there should be no control by the Government of India. Is that workable?—I think it would be workable. There have been cases before where the Government of India made allotments to Provinces for certain purposes.

28136. Without asking for interference?—They give a grant for certain schemes

28137. Unconditionally?—The scheme is first put up for their approval. We say "we are going to do such and such a thing, we may open agricultural schools, we may employ a Botanist for rice." But when once a scheme is considered sound I think the provincial department should be allowed a free hand to carry on the work.

28138. But because they give a grant, supposing they want some sort of direct or indirect interference would the Ministers tolerate that?—I do not think the Minister would mind it if he were getting the grant from an outside fund for a certain bit of work. A report would be made on how the work was going on, and so on.

28139. You suggest a Provincial Veterinary Research Institute. Do you at the present moment take advantage of the Imperial Veterinary Research Institute?—A good deal of advantage is taken of that, not directly by the Agricultural Department, but more directly by the Veterinary Department.

28140. You want to separate the Research Institute from the Provincial Veterinary Department because you think the Imperial Institute is too far away or because it is not sufficient?—The problem is so big and so local in importance that both institutions might well be provided for.

28141. You make a very significant statement regarding the middle class youth: "Agriculture will be more attractive to middle class youths when it is made more profitable and when the general conditions of rural life become such that educated men can feel there is full scope for their energies and abilities outside the urban areas". Now, I read this in conjunction with another paragraph on page 6 of the Provincial Memorandum simply to bring out one aspect of what I might call the agricultural psychology of the people. The statement runs thus: "Many of the holdings (in the cotton tract of Berar) are of a good size and many of the bigger landowners take an active interest in agriculture". And you depict a picture how it has led to a rapid growth of gins and presses and to a better realisation of the value of machinery and of improved implements and so on. That only goes to prove that if people see there is profit in the efforts they put in, no inducements by the department are necessary; am I right?—If it is profitable *ipso facto* it becomes attractive.

28142. And, conversely therefore, in some Provinces where agriculture is not likely to be profitable either because the holdings are only of 2 or 3 acres on an average or because the tract might be dry whatever the efforts of the people or the department, progress in agriculture must be *ipso facto* very very slow owing to sheer despair; do you agree?—Yes.

28143. And it will be very difficult to improve conditions where nature contends against man?—Yes.

28144. Will you kindly give me some further information about the demonstrators which you hope to have when you expand your department. You have at present only 21 demonstration plots. Of what character are they? Are they on the cultivators' fields?—We get small areas on annual lease for five years; there is not one close here, otherwise you could have seen it; there is one in the adjoining district.

28145. The point I am driving at is not the size of the plots, but the proportion their number bears to the four circles?—You mean 21 are not enough?

28146. Yes?—I think we want more. In fact, in my opinion, we want one such plot within easy reach of every village.

28147. I think you have stated in this memorandum that you have in all 83 taluks and that you hope to have later on at least two *kamdars* to look after the demonstrtation work in each taluk; is not that the case?—Yes.

28148. You have at present only 21 demonstration plots for 83 taluks. I wonder how many villages there are in each taluk on an average, 75 villages?—More than that.

Mr. Wills: About 400 villages in each taluk.

Mr. Kamat: Very well, multiplying 83 by 400 you get an enormous number of villages and I am just trying to point out that the 21 plots which you have at the present moment for these thousands of villages are hopelessly inadequate.

28149. In this Province, is there no conflict between your department and the Irrigation Department? In some Provinces, we have heard an entirely different story. For instance, how do they distribute water for sugarcane: is it by the acre, or by turns to each cultivator as he applies?—On the days on which it runs down the channel the water is given out. If you would, I should like you to take evidence on this point from actual cultivators.

Because in some other Provinces, the Irrigation Department has almost come to be called the "irritation" department.

28150. *Sir Thomas Middleton*: Is the Agricultural Department responsible for the supply of statistics to the Government of India?—No, that is done by the Director of Land Records.

28151. So that you have no responsbility except to assist with the crop experiments?—Yes, and a general survey of crop forecasts.

28152. Do you make that survey in consultation with the Director of Land Records?—We put up our general notes on some of the crop forecasts; for instance, we are chiefly concerned with the final forecast on cotton; the Land Records staff are at liberty to consult the agricultural staff as much as they require.

28153. In answer to Mr. Kamat you agreed that the men employed at an Imperial Research Institute should be of a somewhat higher calibre than the average men who are employed in research work in the provincial departments?—Yes.

28154. Apart from the men, could you distinguish in terms of work between the types of activity that should be undertaken by central departments and by provincial departments?—No, I have not been able to distinguish between the types of work at all.

28155. I think you are a chemist who has given a good deal of attention to soil chemistry?—Yes.

28156. Do you think it would be practicable for a central institution like Pusa to take up the general question of what one might call the soil balance?—I think the question is rather too large a one to be brought under one head like that.

28157. Large in what sense?—It covers too big an area.

28158. It is not very large in the other sense that it requires the collaboration of a number of very specialised workers?—That is so.

28159. Would it be possible provincially to get the group of specialised workers that would be necessary to study that subject in all its aspects?—It should be possible, and it would be possible, provided funds were provided; I see no reason why work of that sort should not be done in the Provinces.

28160. In addition to at least one and possibly several chemists, you would require men who had specialised in protozoology, bacteriology, and soil fungi?—Yes.

28161. And, even if the funds were available, do you think it would be possible to secure a staff of that sort to work in a provincial area?—I think so, because there should be no difficulty in getting a staff of that kind, provided men were trained for it if the need was felt and it was considered to be a work that should be done; because if you were going to tackle a question like that at a central institution, you would

want a very much larger staff of the same type of men to deal with the problem for the whole of the Provinces.

28162. You would certainly want a larger staff, but many of the persons employed would be of the Assistant grade working under experienced officers. Your objection is that the conditions in India vary so widely that one central institution could not tackle, as Rothamsted does for England, this particular question?—Yes, and a man must be, I think, very much in touch with the Province in which he is working.

28163. Would it not be possible to get over the difficulty of touch with the Provinces by arranging for co-operative work *e. g.*, sampling and certain other matters being taken up locally, and the subject worked up at a central institution?—It would be possible, I think, for some of the work to be done in the Provinces and some at the central institution.

28164. You recognise that for work of this discription continuity is essential and continuity over a long term of years?—Yes.

28165. Do you think that if this question were tackled locally in Indian Provinces, there would be much prospect of securing the continuity which is required?—There is a danger of the work being broken off in the Provinces; on the other hand, if it were financed from an outside source where the funds were likely to be permanent and continuous, I see no reason why it should not be carried out in the Provinces.

28166. If you had endowments?—A fund which you knew was likely to continue for a good many years.

28167. Do you think that work on such a subject as animal nutrition should be centralised or worked at provincially?—There is a good deal of work that can be done in animal nutrition at a central institution, fundamental work, but I do not think that should in any way present or displace work of the same type which could be done in a provincial institution.

28168 It is obvious that if there is work of a fundamental character in progress at a central institution, it would be necessary to have local work carried out on problems arising at the central institute?—Yes.

28169. For work of the fundamental character to which you now refer, do you agree that it should proceed under the Agricutural Experts of the Government of India, or would you prefer, as in the case of soils, that strong local departments should be developed?—I think work of that kind which is very new to India might a start be done at the central institution, but I think it would be necessary to develop that work in the Province, because, wherever the central institute is situated, the conditions there may vary tremendously; for instance, I am not sure that all the work which is done at Bangalore, which is in a very nice climate, would be quite applicable to the conditions prevailing in the Central Provinces in the hot weather.

28170. I have mentioned two examples; are there any other lines that occur to you at the moment for which it would be desirable to work centrally rather than provincially?—Such a thing, for instance, as agricultural meteorology, of which we practically know very little in this country, might be started at a central institution. We could not very well start that in a Province, because, to begin with, there is no staff; one does not know quite where to obtain a suitable man.

28171. That is a subject we have recently started to work at in Britain, and in that particular case we have had to start most of the work locally?—We have established crop weather stations in a number of areas and the results are worked up centrally? But I think the Province would need a lead in that respect; we are rather in the dark regarding agricultural meteorology. Then again, on such a thing as soil physics, as a whole we are rather in the dark about that. Although problems would have to be worked out locally, it would be well to get a lead from some central institution where they could probably employ a much better man for a certain number of years than we could hope to employ in a Province or in a number of Provinces.

28172. Have you in your work as a soil chemist felt the need of a physicist?—Yes, more and more so.

28173. And you have felt that if there were a physicist available at a central institution he would have been of use to you?—He would have been very useful for consulting on various points.

28174. You have at present a 2 years' course and also a 4 years' course at Nagpur. We found in another Province that the demand for the 2 years' course had disappeared. Do you anticipate a falling off in the demand for the 2 years' course in Nagpur, or are the prospects good?—The 2 years' course will take rather a different type of man from the 4 years' course; the 4 years' course is a much harder course. The 2 years' course provides for a man of a rather lower intellectual standard, and perhaps a poorer man who could not afford to remain at a college for 4 years.

28175. The idea, I think, of this 2 years' course was to prepare men to go back and farm on their own estates?—Yes, and to act as agents for other estates, and so on.

28176. My point is whether there is likely to be employment for such men in the Central Provinces?—I think there would be to a certain extent, because men of that type will always be obtainable at a much lower rate of pay than a man who has had a 4 years' course and has taken a degree. At our present rates of pay for men of that kind, we start the 2 year men in the department at Rs. 50 a month, and the 4 year men at Rs. 70 and Rs. 80 a month.

28177. In reply to the Chairman you expressed the view that perhaps too much attention had been paid to agricultural science and too little to economics?—I think that was probably so in the early days of the teaching of agriculture.

28178. I notice that now you do a good deal of economics in the final year at Nagpur?—That has been a gradual change in more recent years. Much more economics is taught now than when the agricutural college started, probably because there is much more material available.

28179. You have just stated that the initial pay given to the 2 year man who enters the Upper Subordinate Service?—The 2 year man enters the Lower Subordinate Service on Rs. 50 and the four year man enters the Upper Subordinate Service on Rs. 70 or Rs. 80. As a matter of fact, we have not yet recruited any man of the degree course because the college has only been afficiated about a year; but we have been recruiting men who have taken the longer course, on Rs. 70 or Rs. 80 according to the standard they reach at the final examination.

28180. What is the pay on recruitment of men who enter the laboratories as Assistants?—We only take those men in the Upper Division; they come in on Rs. 80 because the recruitment to the scientific sections is rather less and we only have a few of them: they have to be the very best men.

28181. Do you agree that besides being the best men they ought to be men who had a rather different training, a more specialised training?—They must have post-graduate training; we feel a need for that; in fact, we are now beginning to recruit graduates in pure science and then give them a specialised training.

28182. You point out that a bureau to summarise the work done in the Provinces would be useful; is not that already provided by the Advisory Council of Pusa in connection with the publications of the memoirs?—The only work that I know that the Advisory Board does is to scrutinise the memoirs.

28183. It is laid down as part of their duties that they should edit the memoirs?—I think also there is rather a feeling in the Provinces that a memoir in any particular subject should be scrutinised rather more by a board of men with special knowledge of that subject than by a general advisory board such as the Pusa Board. For instance, if a botanist sends in a memoir it would be better that that memoir should be scrutinised by a number of botanists than by a general advisory board.

28184. I think that is done; it is laid down that such papers may, at the discretion of the Council, be submitted to selected readers nominated by the Council. That does carry out your suggestion: they would obviously submit a botanical paper to botanists?—I have known that feeling to be expressed amongst provincial officers.

28185. You point out that the Agricultural Department would welcome any improved methods for wider and more timely discussion of weather forecasts. How do weather forecasts reach you: through the newspapers or by special telegrams?—They do not reach me personally at all, I do not get any weather forecasts; I only get the local weather conditions.

28186. Through the newspapers?—Yes.

28187. Is not there an arrangement by which the department is directly informed by the Meteorological Office?—There is no arrangement existing at present.

28188. You draw attention to the value of *karanja* cake for sugarcane; have you been conducting any experiments with that material?—Yes.

28189. What is the composition? Can you give the percentage of nitrogen?—It is between 4 and 4½ per cent; very much like castor cake, it is one of the rapidly acting cakes.

28190. So that it has two qualities essential in a manure for sugarcane?—Yes. I might say that when we started work on that it was bought at an extremely cheap rate; since we began to advocate its use its value is now appreciated, has risen and the market rate has gone up.

28191. I think you point out that the best cattle in the Central Provinces are to be found in the areas in which there is least grazing?—Yes, that is so.

28192. Can you tell us how the cattle are fed in those areas during periods of scarcity, that is between February and July?—The particular part which is referred to is Berar where a good deal of *juar* is grown; they are fed on the *juar* stalk which is stocked for the purpose.

28193. Is cotton seed not used?—Yes, it is used as the concentrated food and the other as the bulky food.

28194. Is cotton seed the main concentrated food?—Yes.

28195. And that they have in abundance in Berar?—Yes.

28196. You also point out that there is a decided tendency in recent years to cut down the area left as grass borders in tilled fields? Are these fields enclosed or open fields?—Open fields.

28197. The advantage of grass borders can only be secured in an enclosed field?—The grass border in the open field is the only place where the cattle can graze

28198. It is really common pasture ground?—Not always. It is just the border where the cattle can graze.

28199. In answering a question put by the Chairman I think you used the expression that if found economically desirable the cultivators will take up fodder crop growing. I do not quite follow the *if* there. As I see the position in the Central Provinces you have a scarcity of labour and a need for labour-saving implements; to use these implements effectively you must have good cattle?—Yes, but one has to convince the people that this is an economic suggestion, and economic practice that it is worth doing.

28200. So that the *if* is in the mind of the cultivator, and not in your mind?—No.

28201. You have a scheme here for using the forest areas for breeding purposes I take it that you are thinking of bullock breeding and not bull breeding?—In the early stage it will be bullock breeding until we have established a really good herd with which we hope to turn out bulls. The ultimate object is a bull breeding centre, but in reaching that object we shall produce a good number of bullocks and shall continue to produce where the animals are not up to the standard of bulls required.

28202 I hope that before that time comes you will have removed the *if* from the cultivator's mind?—Yes; as a matter of fact when a man has an animal that he really values he takes the trouble to feed it. This is particularly the case in the cotton tracts, because there the animals are of a higher class.

28203. *Mr. Kamat*: I have just one or two questions to ask you. In this Province, you have attempted to achieve one or two things and one of them is the regulation of the cotton markets in Berar. On the whole, do you think the rules are successful?—As I said before, in theory I think they are successful; in practice difficulties arise.

28204. In framing them was the initiative taken by the Indian Central Cotton Committee or was it by the Local Government?—It dates back before the days of the Central Cotton Committee.

28205. So that it was the Provincial Government which took the initiative and framed the rules?—It was a local body of some kind, I am not sure at this date whether it was the Local Government or the local market committee, but the framing of these rules was taken up long before the Indian Central Cotton Committee was started.

28206. Do you think that similar rules are capable of achieving some success even in other markets like grain markets?—I think so.

28207. You think that the experiment is worth trying?—Yes, I do.

28208. Now about consolidation of holdings, although you do not like to go into details about consolidation in Chhattisgarh, I dare say you can just give me a rough idea of what you have been able to achieve in this Province?—The consolidation of holdings is not under the Agricultural Department at all. It is either under the Commissioner of Settlements or the Commissioner of the Division. All the information that has been supplied has been in the form of pamphlets, but the Agricultural Department has not come into the scheme as yet.

28209. And you have no opportunity of observing the principles on which it was done in Chhattisgarh?—It is only just being done here.

28210. I am asking you because another Provincial Government, Bombay, is just introducing legislation, in fact it has framed a Bill and I imagine certain principles of consolidation which you by experience may have found essential here may be of some use or application in that Province?—I think the position in Bombay is very much the same as it is here. We are feeling the way.

28211. But here one advantage is that you have got the malguzari tenure system which applies to the whole village and not to each cultivator, so that this consolidation is probably facilitated by the fact that you have a specially convenient tenure here?—No, I do not think so. It was started owing to the fact that the great necessity for it forced itself on our notice.

28212. You think the principles of consolidation tried here are also likely to succeed in the case of ryotwari tracts?—I could not give you an opinion on that.

28213. *Prof. Gangulee*: Is there any demand from the public or the department?—There is a great demand from the public, but whether it will work out or not we do not know.

28214. *Mr. Kamat*: Do you think that consolidation would not be sufficiently successful merely by the spontaneous efforts of the cultivators?—I very much doubt it.

28215. And legislation is the only method on which one can rely?—I think legislation is necessary.

28216. *Sir Henry Lawrence*: You have a budget of about 17 lakhs?—Yes. It is between 11 and 14 lakhs for agriculture alone.

28217. That is about 3 per cent of the revenues of the Province?—I could not say without referring to the figures.

28218. And how much do you want?—I put up schemes for an additional two to three lakhs. We might continue that almost indefinitely.

28219. Would you spend usefully an increased sum of two or three lakhs a year for an indefinite number of years?—Yes, provided we get the staff, and I think that we shall get the staff more easily in the near future.

The Chairman: That is the limiting factor.

28220. *Sir Henry Lawrence*: If you can get the staff to continue the expansion of your department, you can increase your expenditure, between two to three lakhs every year for some years to come, up to a total of 30, 40 or 50 lakhs?—Well, I have not looked so far ahead, but I think we can easily do with 30 lakhs at no distant date.

28221. *Sir Thomas Middleton*: You are thinking of the expansion of the district offices mainly?—The expansion of all sections.

28222. *Dr. Hyder*: Supposing you were a cotton grower in the Berars, what dues would you have to pay if you carted your cotton to the market?—It all depends on how I sold it; if through a broker I should have to pay his dues.

28223. But supposing you brought it yourself on a cart, you would have to pay Rs. 2 for octroi duty and for the market two annas a cartload?—Something like that but I am not sure what it is.

28224. And there is in addition, what is known as forced charity for which you pay another 2 annas?—As a matter of fact, the information supplied by this Government is as follows: Rs. 2 octroi; 8 annas market charge per cart of about 600 lbs. and 3 annas brokerage for 400 lbs. These are the figures given on page 10, paragraph 22 (page 3 above); I do not think that is the case in Nagpur.

28225. Is this rate of duty general? Does it apply to all tracts?—It varies from place to place. The Nagpur rate is a particular rate.

Mr. Wills: It has just been reduced at Nagpur from Rs. 2 to Re. 1.

28226. *Dr. Hyder:* Do you regard that as a healthy sign?—Yes, from the point of view of the cultivator.

28227. Because the duty is initially paid by him?—Yes.

28228. You speak of the cultivator having a share in the general educational movement. Have you come across many *Chamars* and *Mahars* who have benefited by the establishment of primary and secondary schools? Take the Chhattisgarh Division in which these two castes—*Chamars* and *Mahars*—predominate. Have they benefited by these schools?—I could not say because I do not know the number of *Chamars* and the lower castes attending the schools.

28229. Have you ever come across a *Chamar* who was a matriculate in the Central Provinces?—I cannot think of any *Chamar* at present, but I know of some other low caste men who have matriculated.

Sir S. M. Chitnavis: *Mahar* graduate, not *Chamar*?

28230. *Dr. Hyder:* *Chamars* and *Mahars* in the Chhattisgarh Division are purely cultivators?—Yes.

28231. I thought that these were the people with whom you had to deal as Director of Agriculture?—We have only really begun to teach the agricultural population to the extent that we see it worked out, and naturally it is easier to deal with the literate than with the illiterate class.

28232. How are you coping with this nuisance of *kans* grass?—By ploughing it up with suitable ploughs.

28233. And you have had success?—Yes.

28234. How are these crop forecasts prepared here?—They are prepared entirely in the office of the Director of Land Records by the land revenue staff.

28235. Do you know anything about them?—Yes, only with regard to cotton for which we are responsible.

28236. Could you define the term 'normal' or 'standard outturn'? What do you mean by those terms?—Normal outturn is an outturn which a man would generally expect.

28237. Is that your standard outturn then? Would that be your standard outturn, taking good and bad years alike?—Yes.

28238. When the Revenue Department institutes these crop-cutting experiments they carry them on over a large number of years and then come to some decision as to the normal or standard outturn?—Yes.

28239. Are both those terms the same?—I think they are.

28240. You measure your normal outturn in terms of annas. 16 annas standard crop?—No. That is more than the standard. 13·3 is the normal.

28241. Your standard would be 13·3 also?—Yes, expressed in an anna outturn.

28242. If I asked you to prepare a crop forecast, you would have to look at the crop and take its condition into account. How are you going to correlate the estimate according to your eyes with this standard of normal outturn? Will it be in terms of annas?—Yes, above or below normal.

28243. Then you have to correlate that with another quantity, the yield in maunds or whatever your unit of measurement may be ?—Yes.

28244. From that you find the outturn ?—Yes. The normal outturn of wheat in a certain district might be 600 lbs. an acre, and that would be the 13·3 anna outturn.

28245. *Sir Henry Lawrence:* Do you deal with this estimation officially ?—No.

28246. *Dr. Hyder:* In your opinion, is the Revenue Department qualified to undertake work of this kind ?—The great point is that in order to eliminate anything above or below the average you must get a large amount of data. The revenue authorities are able to collect far more figures than we can. We have only one Agricultural Assistant for every two tahsils and he is a junior man without much experience and cannot give a very valuable opinion. He merely consults leading cultivators on what they think the outturn is. On the other hand, the revenue people can collect far more figures than we can and by collecting a large amount of data like that the extremes are eliminated.

28247. How many ploughings do you give for wheat in Berar ?—It is not usual to give many.

28248. Do you think you would get a larger outturn with an increase in the number of ploughings ?—It is satisfactory to give deep ploughings every few years to help to retain the rather low rainfall in Berar.

28249. You said in reply to a question by Sir Ganga Ram that much of the rainwater drains off the land. Is soil erosion a serious problem in your part of the world ?—In a good many places it is. Sir Ganga Ram was talking chiefly of irrigation tanks, which are generally constructed in districts where the rainfall is high rather than in Berar where the rainfall is generally low.

28250. Looking at the natural configuration of the country, it seemed to me as if soil erosion would be an important problem here ?—In many places, it is very serious.

28251. You are benefiting Bombay at your expense. The Tapti carries a lot of water ?—It carries some, but most of the rivers flow to the other side.

28252. With regard to the diminution of the area under wheat, has this taken place entirely in your main wheat tract ?—There has been a big reduction in the wheat area in Berar in recent years. There is not a very heavy rainfall there and, with the rise in the price of cotton, land that used to be under wheat is now being put under cotton.

28253. Has there been a diminution in the wheat tract ?—Not a serious one.

28254. Do you know anything about the cost of raising wheat ? Has that gone up ?—The cost of all agricultural operations has gone up with the rise in the price of labour, seed and so on.

28255. Was there much importation of wheat into the Central Provinces 25 years ago ?—I should think there was a good deal.

28256. Has there been any increase since in that importation ?—Not that I know of.

28257. Apart from this question of substituting cotton in the Berars, you are in a position to import more wheat and therefore you do not grow more ? This explains to some extent the diminution of the area of wheat in your northern tract ?—Yes.

28258. *Mr. Wills:* It is due to the expansion of cotton owing to its high price ?—A good deal of land has gone out of cultivation owing to the growth of *kans* grass. If that is brought back it will increase the area under wheat.

28259. The *kans* grass has affected the wheat area ?—Yes, to a greater extent than the cotton area.

28260. *Sir Henry Lawrence:* Is this figure of 13·3 for normal outturn the figure accepted by the revenue regulations ?—I think it is. It represents the outturn which a man has a right to expect.

28261. *Mr. Wills*: We had a system by which 100 was regarded as the normal and 120 corresponded to the 16 anna crop, 100 being equivalent to 13·3 annas, which is regarded as the normal. That system has been changed?—I am not sure when the change took place, but 13·3 is now the normal crop. 16 annas is a full crop and 20 annas would be a bumper crop.

28262. *Prof. Gangulee*: With regard to facilities for post-graduate training, how many students do you know of who have gone to Europe for advanced studies in agriculture?—A good many have been to America and I have had three men come to see me in the last month or two who have trained themselves at their own expense, two abroad and one in India.

28263. Do most of them go at their own expense?—A good many do.

28264. In view of those circumstances, do you think it would be better to have such facilities in India?—The trouble with these men who come back with this training is that it is difficult to find them employment, and until we can see how to find employment for men who are already trained at their own expense I should not be prepared to suggest any further facilities for training men in India.

28265. Do I understand that you would not have any post-graduate training either in India or abroad?—I would not give any particular facilities for it at present until we see how things develop. We do not want to create the men before we create the posts.

28266. You would agree with me that the development of agriculture depends on our getting the best men?—Yes.

28267. Would you like to see Pusa developed into a sort of Rothamsted in India?—I should.

28268. Both for central research work and post-graduate training?—Yes.

28269. Are you a member of the Board of Agriculture?—Yes.

28270. Would you tell us what you think of that body and how it functions?—The difficulty is that there is no force behind their recommendations. Their recommendations, in many cases, have been excellent, but there was nothing to press the local Government or the provincial department to put them into operation. There have been many occasions on which additions to the strength of provincial departments have been strongly advised by the Central Board of Agriculture, but when it comes to finding the money, the provincial departments cannot always get it, and so this advice falls to the ground.

28271. You have already given us an idea of your research work; are any experiments for the purpose of retention of soil moisture being carried on here?—Most of our cultivation experiments, deep ploughing cultivation, different implements and so on, have as their main object the retention of soil moisture.

28272. You are tackling the problem of dry farming?—Yes; a great deal of the farming in the Central Provinces is nothing but dry farming.

28273. Have you explored the possibilities of introducing hemp cultivation?—A good deal of hemp is grown in parts of the Province.

28274. Are there great possibilities in that direction?—It must be remembered that hemp is a crop which all cultivators will not touch.

28275. Why?—There is a prejudice against it; it is not a crop of universal application.

28276. *Prof. Gangulee*: I was asking about *sann* hemp?—*Sann* hemp will only be grown by certain classes. There is not much reluctance to grow it as green manure, but as far as the processes of retting and preparation of fibre are concerned, there is definitely a disinclination on the part of many classes to touch the crop.

28277. Even if it pays?—Yes, even if it pays.

28278. On page 39 of the Provincial Memorandum, a statement is made that the water requirements of the wheat crop have been worked out under different soil conditions; could you kindly submit to the Commission a statement showing the results of your experiments?—We could get a statement of the kind prepared, if you would like to have it.

28279. We have had considerable discussion on water requirements?—This is for the wheat crop.

28280. Have you extended it to sugarcane?—We have a good deal of information regarding the recommendations for the amount of water to be put on to various crops, and I think I could collect it for you.

28281. Are these results obtained by following Dr. Leather's work at Pusa?—These are field experiments.

28282. If I understand aright, the chief achievements of your department is the supply of pure seed of rice and cotton?—Yes and wheat.

28283. Do you certify pure seed growers?—We recognise them.

28284. You do not certify them?—We do not give them a certificate; they are recognised by us as pure seed growers.

28285. What step is then taken to ensure the continuance of pure seed?—The growing crop is carefully inspected by officers of the Agricultural Department.

28286. From the chart that you have given us, I see that you have Seed Unions here?—Yes.

28287. Could you tell us the function of the Seed Unions?—The Seed Unions are organisations for the continual propagation of improved seed. They are working quite satisfactorily in this the rice tract. They worked for a long time in Berar, but in recent years they have rather fallen on evil days; they are only a partial, success; owing to the prevalence of wilt in cotton, a wilt-resisting variety is wanted. I think, as soon as we have a variety of cotton which will meet present demands, these cotton Seed Unions will function again. The essential thing for a Seed Union is that it should supply seed which is in great demand.

28288. As far as the rice tract is concerned, they are working quite satisfactorily?—Yes.

28289. In answer to Mr. Calvert, you stated that you proposed to make demonstration farms pay?—We propose to make demonstration plots pay. We should like to make demonstration farms pay but they are combined with the seed business, and for that particular reason they are in many cases rather over-capitalised.

28290. I see that the cost per acre in that farm is Rs. 111?—Yes. That is the Waraseoni farm, but a good deal of that is sugarcane.

28291. Do you think you can make that farm pay?—I think so.

28292. With regard to the difference in prices between the rice tract and the cotton tract, how does the price of food grains within any rice or wheat tract compare with that in the cotton tract?—Food grains in the rice tract are the cheapest.

28293. And the wheat tracts?—There is not much difference between the wheat tracts and the cotton tracts. I should think that the cotton tract is a little bit dearer altogether.

28294. I am talking about food grain prices, not cotton prices?—I should think that the prices in the cotton tracts are dearer than those in the wheat tracts, and the prices in both the cotton and wheat tracts are dearer than those in the rice tracts.

28295. *The Chairman:* I cannot understand the position as it exists with regard to the malguzar who lends money to the cultivator on the security of his land. He is of the same class, as a rule, as the cultivator?—Frequently.

28296. So, it does not mean that the land passes from the cultivating classes to the non-cultivating classes?—Not necessarily.

28297. Although, on occasions, it might do so?—Yes, if the man advancing money happens to be of another class.

28298. I think you may like to know that a gentleman, Rao Bahadur M. G. Deshpande, whose written evidence is before the Commission, tells us in his answer to our Question 3 on Demonstration and Propaganda:—"My experience as a member of the Board of Agriculture, Central Provinces, shows that money for research is generally comparatively easy to obtain, but the provision of funds for propaganda is almost ludicrously inadequate". Have you anything to say on that?—I think, comparatively speaking, far more money goes into propaganda than into research, but the propaganda work covers the whole of the Province and its needs of course are far greater, there is no comparison between the two objects.

28299. I want you to understand Mr. Deshpande's point, that the provision of funds for propaganda is ludicrously inadequate; he complains that propaganda does not get enough?—That is quite so, because we want to double our propaganda and extension staff by increasing the number of Agricultural Assistants. Now, if we double the number of Assistants in, say, the botanical section, it would mean adding on perhaps six men, whereas, if we double it in the demonstration and extension section it means adding on perhaps hundred men.

28300. Are you satisfied yourself that the balance between the two sides of the budget is good?—I should like to expand demonstration work quicker, but then of course it takes far more money to do that.

28301. Will you tell the Commission, quite shortly, what the experience of this Provincial Government has been in its attempt to provide vocational middle schools in agriculture. The Provincial Memorandum, on page 53, paragraph 144 (page 22 above) says: "Certain attempts have, however, been made to meet the demand that definite agricultural instruction should be imparted in rural schools. The most important of these was the opening of two schools in the year 1918-19, one in the wheat tract and the other in the rice tract". Could you give the history of these two schools?—These two schools were started largely as vocational schools, that is, to take boys, of an age from 11 to 14, and teach them the rudiments of agriculture, based on a primary school course. One school is at Chandkhuri, 16 miles away from Raipur, and the other school is at Powarkhera, which is 4 miles from Hoshangabad. The conditions in those two tracts are entirely different, and we have a different type of landholder. The Hoshangabad landholder is much more enterprising and rather more advanced; the local man here is, as a class, rather backward. Neither of these schools really caught on, for various reasons, and we did not have the boys coming to them.

28302. Were those schools of the Loni type? Are you familiar with the Loni type of school?—I have heard a good deal of the Loni type of school. In these two schools agriculture was being taught as a vocation, the boys were being taught technical agriculture. As soon as it was found that no posts were obtainable, or at least that they were not guaranteed although in some cases they were obtainable, the number of boys gradually fell off; the whole question of vocational training was carefully gone into by the Central Provinces Government, and they came to the conclusion that these schools should be closed. But, at the last moment, I was able to get the Director of Public Instruction to modify his draft resolution to keep on the Powarkhera school and to give it a fresh start with a changed syllabus. We made general education, including English, the feature of the school, coupled with agriculture; not agriculture as the primary thing with a certain amount of general education added, but general education with a certain amount of agriculture. That caught on, and a large number of the cultivators in the locality were very keen on this school and they sent their boys to it. They had got people from a number of places, and eventually got this school recognised as an agricultural middle school; that means that the boys of the school are now able to proceed to the high school and from there will be able to matriculate, and we hope that in years to come those of the boys who go to high school will provide some of the best recruits to the Agricultural College.

28303. Do you teach them English still?—We teach them English. The change we made in the ordinary middle school prospectus, which the Education Department accepted, was that instead of natural science we should teach agriculture and instead of drawing we should teach field surveying; that is about all the difference.

28304. *Prof. Gangulee*: Is agriculture taught by the ordinary teacher?—The ordinary teacher of the school, assisted if necessary by the Agricultural Assistants

on the farm. Originally the masters were all given a special training at the Agricultural College. That school is now full, but as it is still in the nature of an experiment, we are not adding to the permanent buildings; we are trying to find out how it goes on; it appears to be a success, but we shall not really know about it for a year or two, until we see what the future careers of the boys are. But there is a very strong demand for a school of that type in other districts. The school is extremely popular, and we have had to turn away a large number of applicants. We are asked to make provision for 100 more boys. In order to provide the teaching staff, we had to transfer to it teachers from other schools. It is a 4 years' course; agriculture is one of the subjects on the curriculum, and they have a certain amount of practical work. I believe that the practical work is a genuine thing; I have often paid surprise visits to the school, and have found the boys engaged in real practical work.

28305. *The Chairman*: And the school is in your budget?—It is entirely under our control.

28306. What prospects of official employment has the boy who goes there today?—We offer them no prospect of employment at all. We hope that his father, if he has no intention to send him to the high school, will take him back on his own land.

28307. You have not yet had time to judge the results?—It has been going only for a short time: the first batch of boys from the school are entering the high school this year.

28308. *Sir Thomas Middleton*: Were these schools started as a result of the conference on agricultural education at Simla?—Yes.

28309. *The Chairman*: What do you mean exactly when you say they are based on a primary school course; do you mean there is a primary section linked?—They come to us from the primary school.

28310. You have not got a primary section linked to the school?—No, but the present arrangement is entirely experimental, and though there is a big crowd at the school we have not spent money on *pucca* buildings, because we want to see how the experiment works.

28311. Can you tell the Commission whether you know definitely of any parents who have sent their boys to the school, with a view to their being more efficient cultivators?—No, I cannot say that they have sent them there because they want them to be more efficient cultivators. A good many parents have sent them there because they wanted their boys to have an education which would fit them to go back to the land, and also some boys were sent there because they were boys who were going back to the land and they wanted them to have a general education of the standard given to other boys of the same class.

28312. Do you think you see any signs of a growing demand for general education amongst cultivators for their sons?—Yes; in certain tracts particularly.

28313. In particular tracts, you definitely see an increase in the demand?—Yes; I think, at the present time, we could open a number of schools of this type, but I do not know how it will be in four or five years' time, when they have seen what it leads to.

28314. You are going carefully?—Yes, entirely as an experiment. You will have an opportunity of seeing the school on the 29th. The other school is closed.

(The witness withdrew.)

APPENDIX.

Note on Silage making in the Central Provinces and Berar by Mr. S. T. D. WALLACE, Deputy Director in charge, Animal Husbandry.

Previous to the year 1920 the making of silage was confined to the Agricultural College farm on which a tower silo had been built for demonstration purpose in connection with the teaching of the students. Excellent results were obtained from the use of pit silos on Telinkheri Dairy farm during the year 1921-22 in consequence of which pit silos were constructed on all Government cattle-breeding farms in the Province during the following years. The pits were in nearly every case filled in with green *juar* which had been passed through a fodder cutter driven by a small 3 H.P. engine. The pits were in the majority of cases filled at the end of October and opened at the end of April. It was found that cattle very quickly learned to eat the silage and after a few days ate it greedily.

In October 1923 two demonstrations were given in Wardha district. The engine and fodder cutter had to be sent by rail and at each centre *juar* cut from an area of about three acres was chaffed and put into a small pit. These demonstrations were largely attended and it was found that the material put into the pit produced excellent silage when the pit was opened in the following April. Two or three similar demonstrations were given in the following year and it was found that in each case the village cattle soon learned to eat the silage greedily. The chief objection raised by the villager was that he lost the grain and it was difficult to convince him that he was not a loser thereby as the grain was recovered as feed. On the other hand, it was admitted by everybody that the fodder produced was of excellent quality that cattle ate it readily and it was a great improvement on the usual dry grass or *karbi* stalks on which the cattle usually existed at that time of year.

It has been proved that a pit silo properly sited and provided with a *kutcha* roof of grass will keep silage in perfect condition through a rainy season and two hot weathers at least. An experiment is now being carried out at Telinkheri in which a grain *juar* was used. The grain was allowed to harden and heads were removed before the crop was cut. At the time of filling the fodder into the silo pit it was observed that although the bottom leaves of the plant were yellow the stalk still contained sufficient juice to render the production of silage fairly hopeful. These experiments will be carried out during the coming hot weather.

It is found that cattle fed on silage in the hot weather keep in much better condition and that milch cattle do not dry off so quickly and give more milk than others which receive the ordinary dry roughage. A series of feeding experiments have been arranged to test the value of silage as a feed as an economical proposition against the feeds usually available during the hot weather.

During 1925, the number of demonstrations in villages were increased to six. This increase was due to the purchase of a motor lorry which made the transport of the engine and fodder cutter from one point to another much easier. The period during which silage can be made from *juar* is limited to a period of about three weeks at the end of October.

Grass silage has also proved to be successful if proper care in siting pits is taken; on Government farms, however, *juar* has up to date been found to be the best fodder to use as it produces the greatest bulk and quality from a given area.

It has been found that an engine and fodder cutter costing about Rs. 1,000 is quite suitable for chaffing the *juar*. Chaffed *juar* packs tighter into the pits and reduces waste, the silage is also much more economically removed from the pit.

Tower silos are expensive to construct and fill, there is a greater percentage of waste than in a well-made pit silo. The following is a rough estimate of

the cost of producing silage from an acre of good *juar* yielding 8 tons per acre of green fodder or 3½ tons dry matter:—

Cultivation, manure and seed ... Rs. 20 per acre.

Harvesting and filling into pits ... Rs. 6 „ „

The cost of digging the pit depends on the nature of the soil, but it is a work which can be carried out during a slack season of the year.

An average grass *bir* may be estimated to yield 1,000 lbs. of dry grass per acre which cut, carted and delivered in Nagpur is valued this year at 100 lbs. per rupee.

The cost of the dry matter in an 8 ton crop of silage works out at about 70 lbs. per rupee, if the green fodder is valued at 200 lbs. to the rupee.

The feeding value of the dry matter in silage is undoubtedly of a higher standard than that of the dead grass which is cut and called hay.

The system of ensilage would prove a valuable method of improving and increasing the fodder supply of these Provinces. It is of undoubted value to milch stock at a time when no other succulent fodder is available except in irrigated areas.

Silage made from grass would be much better fodder than the hay produced by leaving the grass to wither and die before cutting, moreover certain varieties of grass would be more palatable in the form of silage than in the form of hay.

Supplementary Note by Mr. F. J. PLYMEN, Director of Agriculture.

Silage.—1. It cannot be said that the practice of feeding silage has made much progress in this Province. The following reasons militate against its adoption:—

(*a*) Lack of conviction that it is a sound economic proposition. More work on this aspect of the question has still to be done.

(*b*) The poorer cultivator is not in a position to adopt it, the well-to-do man has not shown much willingness to do so.

(*c*) There is a certain amount of risk that a *juar* crop grown for the preparation of silage will prove to be too light owing to unsatisfactory climatic conditions. In such a case there is a natural tendency to harvest the crop as an ordinary grain crop.

2. It may be noted that at the Telinkheri Co-operative Dairy where the crop is grown and silage is prepared under the supervision of officers of the department, the *gaoli* members of the society are much in favour of using silage for their milch cattle in the hot weather.

Rai Bahadur TUNDI LAL POWAR, B.A., Deputy Director of Agriculture, Eastern Circle, Raipur.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) The supply of teachers and institutions is not sufficient in my circle.

(ii) Chhattisgarh is the most backward division in an educationally backward Province. It therefore stands in the greatest need for extension of teaching facilities.

(iii) It is most desirable that teachers in village schools should be drawn from the agricultural classes. A teacher not belonging to these classes usually finds it very difficult to understand properly the home conditions, habits and psychology of children belonging to these classes.

(iv) There is no particular school imparting agricultural education in my circle. Two small schools were attached to farms at Labhandih and Chandkhuri, but they had to be closed for want of pupils. In the light of experience gained in these institutions, I am inclined to think that there is no demand for purely agricultural schools. On the other hand, I suggest that the existing vernacular schools in the rural areas may be utilised for agricultural education. Small plots may be attached to selected village schools and the text-books may contain a large number of subjects on farming. My information is that a large number of rural schools are poorly attended, which may be due to the fact that the present system of education given in these schools is not suited to the needs of the agricultural classes. If my proposals are accepted and if the instruction in the village school is given definitely on agricultural lines, the farmers will readily see the benefit of sending their boys to school. This will mean more correlation between the activities of the Education Department and the Agricultural Department.

(v) The prospect of getting Government service is the main incentive which induces boys to join agricultural classes.

(vi) No.

(viii) There are nature study plots attached to the two normal schools in the circle. The pupil teachers who study in normal schools are said to be taking interest in these plots. There are at present no school farms, but there are proposals to throw open the existing demonstration plots at Baloda Bazar and Champa for teaching agriculture to the pupils in the vernacular middle schools in these places in their spare hours.

(ix) Government service.

(x) At present, farming does not hold out as good prospects as can be secured by an intelligent youth in other walks of life and also the life of an agriculturist is hard. Therefore, in order to make agriculture attractive to middle-class youths agricultural qualifications should receive more consideration than at present in selecting candidates for the Revenue Department or in other departments where the officers have to deal with agriculturists.

(xi) Yes.

(xii) Adult education in rural tracts can be popularised by intensive propaganda and cinema.

(xiii) The administration should remain in the hands of the Education Department, but the supervising staff of the department should be partly recruited from the graduates of the Agricultural College.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The following measures have been successful in influencing and improving the practice of agriculture :—

(1) *Seed and Demonstration farms.*—On these farms the advantages of improved methods of cultivation, improved seed and improved implements are demonstrated. A large number of agriculturists visit these farms and are well impressed with them.

(2) *Agricultural Associations.*—There are District Associations, Tahsil Associations, and Circle Associations. The members of these associations undertake to demonstrate on their own farms the improvements recommended by the department and thus help in popularising them. These demonstrations when properly conducted by private individuals go a long way in convincing people of the benefits to be derived from the improvements recommended.

(3) *Demonstration plots for definite purposes.*—Land for these plots is taken in selected centres on lease from cultivators for a period of five years. On the expiry of this period, another plot in a different centre is taken. These plots when managed successfully under conditions obtaining in villages have far-reaching influence on the cultivation in the neighbourhood.

(4) Agricultural shows and fairs.

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(5) Smaller practical demonstrations carried on by the Agricultural Assistants from village to village.

(6) Distribution of pamphlets and bulletins describing in simple language the improvements recommended.

(7) Lantern lectures.

(*b*) A well organised intensive propaganda on the aforesaid lines with a view to impress on the cultivator the importance of agricultural improvement is very necessary. A cinema will be of great help for this purpose.

(*c*) Education and intensive propaganda among the agriculturists accompanied by practical demonstrations will induce cultivators to adopt expert advice more freely.

(*d*) The following may be mentioned as striking instances of the success of demonstration and propaganda work:—

(1) Introduction of seed of the improved varieties of paddy, wheat and sugarcane and the cultivation of ground-nut in the Eastern Circle.

(2) Introduction of the ridge and furrow method of planting cane and use of oil-cake as manure for the crop.

(3) Introduction of iron cane-crushing mills and improved furnace for boiling *gur*.

(4) Introduction of light iron ploughs and winnowing machines.

QUESTION 5.—FINANCE.—(*a*) Co-operative credit societies should finance cultivators for agricultural operations and enable them to hold up their stock for sale at the time when better prices can be obtained. The loans for agriculture, as far as possible, should be made in kind and when they are made in cash, care should be taken to see that they are utilised for the purpose for which they are intended. In the beginning adequate staff should be provided to educate the members of the societies in the principles of co-operation and self-help and to insist on punctual repayment. For cultivators heavily indebted but possessing sufficient security in the shape of landed property, long-term credit by institutions like land mortgage banks will be most desirable.

(*b*) *Taccavi* advances by Government should only supplement the loans by the credit societies. These should always be given in kind rather than in cash as is now being done for the purchase of seed, implements, manure, etc., through the Agricultural Department.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are—

(1) Accumulated debts due to high interest.
(2) Absence of occupation in the slack season.
(3) Increase in family expenses on account of the general rise in the cost of living.
(4) Lack of thrift.
(5) Rise in agricultural wages and small and uncertain margin of profit.
(6) Lack of education and business capacity.

These are the general causes of indebtedness. There are some other causes which are peculiar to certain localities. For example, in Chhattisgarh the Marwaris, Brahmins, and Mahrattas are mostly malguzars. These classes being more brainy freely exploited the Chhattisgarhi agriculturist who like his brethren elsewhere is very conservative in habit and customs. Loans were taken without much thought of consequences, and land has gradually passed from the hands of the real tillers to absentee landlords who employ all sorts of tricks to squeeze out money from their tenants and thus rob them of the fruits of their toil. In many cases, a tenant has to begin the year with borrowed seed because his earnings of the previous year are hardly sufficient to meet his past liabilities.

(ii) The sources of credit are—

(1) Local *bania* (moneylender and malguzar).
(2) Co-operative societies.
(3) Government loans.

(iii) The margin of his profit is so small that after meeting his agricultural and family expenses, he is left with little or nothing to repay his debts. For this his inability to manage his affairs economically and wisely and his ignorance are chiefly responsible.

(*b*) Special measures taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act or to facilitate the redemption of mortgages will certainly afford considerable relief to him. But these will not go a long way in ameliorating his condition unless strenuous efforts for his education and improvement

of his calling are made at the same time. He must learn the principles of self-help and thrift.

(*c*) Non-terminable mortgages should be prohibited, but measures to restrict or control the credit of cultivators such as limiting the right of mortgage will not be in the interest of cultivators at this stage because they have to depend on loans and cannot stand on their own feet at present. These measures can be taken only when the co-operative societies are fully developed and the people are prepared to take full advantage of these.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—Owing to the evil effects of the now obsolete practice of *lakhabata*, the evil of fragmentation of holdings is more serious in this circle than elsewhere. As a result of this it is common to find in every village holdings of, say, 10 acres distributed all over the village area in about 80 little plots of land. This extra fragmentation of holdings is an obvious bar to the advancement of agriculture.

The consolidation of holdings has engaged the attention of cultivators as well as of the Local Government, and to effect this an officer of the rank of Extra-Assistant Commissioner has lately been put on special duty. This subject has been discussed at length by Mr. J. F. Dyer in his Note* on Consolidation of Holdings in Chhattisgarh.

QUESTION 10.—FERTILISERS.—(*a*) Under the conditions obtaining at present, greater use can profitably be made of the natural manures, though artificial manures can also be used with advantage for irrigated wheat, cotton and garden crops. Cattle-dung is the only manure easily available to a cultivator but a good deal of it is burnt as fuel and whatever remains is so badly preserved that it loses much of its manurial value. By preserving it carefully he can greatly increase the manurial value of the quantity he has. At the same time cattle urine, which is equally good as manure, is not made use of. By conserving it, he can greatly supplement his supply. Green manure of *sann* hemp has been found very useful for the rice and sugarcane crops, but on account of the prevailing system of broadcast sowing of paddy its application is not practicable. However, it is being used to some extent for transplanted paddy and sugarcane crops. The use of oil-cake is now freely made for sugarcane and garden crops. Another manure which has given satisfactory results for paddy is bonemeal, but caste prejudice stands in the way of its wide application. The best way of popularising a new and improved manure is to demonstrate its use on demonstration farms, demonstration plots and in cultivators' fields in selected centres under the supervision of the staff of the department and when the crops are ready, to invite cultivators in the neighbourhood to observe the difference between the manured and unmanured fields. This method has been found very useful in convincing a cultivator of the value of new manures.

(*d*) As a result of demonstration, oil-cake is now widely used as manure for sugar-cane and garden crops in this circle.

(*e*) The effect of manuring with phosphate, nitrates and sulphate of ammonia is under investigation.

(*f*) The following methods may be tried to discourage the practice of using cattle-dung as fuel :—

(1) To demonstrate its value as a manure against that of cattle-dung ashes in cultivators' fields.

(2) To supply wood free of charge from Government forest wherever practicable.

QUESTION 11.—CROPS.—(*a*) (i) There is great scope for the improvement of the existing crops by selection and careful breeding. The improved strains of paddy so far evolved yield about 14 per cent more than the *deshi* seed. Both rich and poor cultivators can equally take advantage of these without any extra cost or change of technics; so the improved varieties of the existing crops can be introduced easily and made popular.

(ii) The introduction of new crops largely depends on local conditions, initial outlay, manure supply and labour. If these are favourable, it becomes easy. As an example, the case of ground-nut in this circle may be mentioned. Some years back this crop was unknown here, but now it is grown in some thousand acres. Had it not been for the pig trouble, the area would have been much larger. This crop can be grown profitably on *bhata* (laterite) soil on which inferior millets are sown once in three or four years. There are extensive areas of this class of land which can be utilised for this paying crop.

(iii) Seed of the improved varieties of crops is being regularly distributed from Government farms, private seed farms and through village unions. These have so far served their purpose, but now in spite of the fact that the number of private seed farms and village unions is increasing every year, they are not able to meet the growing

**Vide* pages 152—160.

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demand. Therefore it is desirable that co-operative societies should step in to take the purchase and supply of pure seed on a commercial basis.

(iv) Enormous damage to crop is caused by wild pigs. During recent years, they have appeared even in the open tracts and are multiplying with alarming rapidity. With a view to arrest their growth, pig-killing clubs have been organised in several places and a number of pigs are killed every year, but this number is very small when compared with the increase. Regular beats systematically arranged and extending over large areas haunted by the pest may help in exterminating them.

(c) Paddy is by far the most important crop in this circle, and satisfactory progress has been made in improving it by selection and breeding. The strains of the most promising varieties evolved by the department have found favour with the cultivator for heavy yield and quality and there is an increasing demand for pure seed of these. Wheat stands next in importance. Of the hundreds of varieties tried so far on the experimental farm, P 100 has been found the most promising one. It has established its reputation for high yield and quality and is fast replacing the local wheat.

Ashy Mauritius, J 247 and *Khari*, the varieties of cane introduced by the department, are now seen growing in most of the villages where cane is planted.

Mention has already been made of ground-nut as a new crop introduced.

QUESTION 12.—CULTIVATION.—(i) The system of paddy cultivation as practised here is a primitive one. Seed at the rate of 100 to 120 lbs. per acre is sown broadcast and when the plants have grown about 9 inches high, the crop is cross-ploughed. With this method of cultivation, there is great waste of seed and much labour is required in weeding and removing *karga* (wild rice). The system of transplanting is decidedly more profitable than this, as there is much saving of seed and higher outturn of grain free from *karga* is obtained. Efforts were therefore made to introduce transplanting in place of broadcast sowing and in the course of 12 years the area of transplanted rice was increased from 20 to 41,824 acres. Beyond this it could not go. The main difficulties in the way were scattered holdings, general low pressure of population and low standard of living.

QUESTION 14.—IMPLEMENTS.—(a) The existing agricultural implements are not very effective and economical in use and they can be replaced with advantage by better ones. These should be simple in construction, light in draught to suit local bullocks, cheap, durable and easy to handle. If the new implement possesses the aforesaid merits, it is welcomed by the cultivator. Cane-crushing mills, winnower, light iron ploughs and *gur* boiling furnace may be cited as instances. In this circle, there is no prospect in the near future for costly and complicated machinery.

(b) Practical demonstrations in cultivators' fields by the staff of the department or by any other agency duly qualified for the work will greatly hasten the adoption by the cultivator of improved implements.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(a) In villages where only *kharif* crops are grown, an average cultivator is busy on his holding from the middle of May to the end of December and where both *kharif* and *rabi* crops are grown, he is busy all the year round: from the middle of May to March he is busy on his holding, and in April and the first half of May he attends to the improvement of *bunds* and levelling of fields, repairs of houses and other family and social affairs. Those who have got only one season-crops utilise their spare time in the improvement of holdings if they can afford to do so, otherwise they go out in search of employment as labourers or cartmen.

(b) and (g) Any subsidiary industry which is closely connected with cultivation, such as fruit, vegetable and sugarcane growing will be taken up easily by the agriculturists if facilities for these are offered to them. These industries will enable them to make the best use of their leisure and at the same time provide employment to labourers and needy tenants in the slack season. Irrigation facilities and funds are required for their success. Government can help with these.

(c) The following are the chief obstacles in the way of expansion of such industries as bee-keeping, poultry rearing, sericulture, pisciculture, lac culture and rope and basket making :—

(1) Want of technical instruction.
(2) Lack of finance.
(3) Lack of arrangements for marketing.
(4) Caste prejudice.

(d) No.

(e) No, this will not be in the interest of agriculture. Such industries will create competition for labour and thereby cultivation will suffer.

(f) Yes.

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QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) Agricultural labour flows spontaneously from areas where there is surplus to areas where there is shortage. No efforts in this direction are needed.

(*b*) The shortage of labour is begun to be felt now even in this circle. Labourers are migrating every year in large numbers to industrial centres in, as well as outside, the Province where they get higher wages. This flow of labour can be checked by developing subsidiary industries which will provide work for them even in the slack season of agriculture and by raising the standard of cultivation whereby the cultivator will be able to make more profit and thus be in a position to pay higher wages to them.

(*c*) This is not applicable here.

QUESTION 20.—MARKETING.—(*a*) The existing marketing facilities in this circle cannot be regarded as satisfactory. The principal markets are at Rajnandgaon, Druge, Raipur, Bhatapara, Bilaspur, Akaltara, Champa, Raigarh, Kharsia and Pendra. They are 100 miles or over from the interior and therefore for want of communication facilities the cultivator finds it difficult to cart his produce to these. But after the opening of the Raipur-Vizianagram railway line which is under construction at present, many new markets will come into existence and greatly solve the difficulty.

(*b*) I am not satisfied with the present system of marketing and distribution. Rice is the chief agricultural product of this circle. A cultivator is the actual producer, and between him and the consumer there are the village *bania*, *kochias* (petty traders), traders and big firms. The village *bania* or the malguzar advances grain and money for the agricultural operations in the months of June and July and recovers at the time of harvest grain with 25 to 50 per cent interest and also takes it in lieu of money at a cheap rate. After reserving enough for his next year's use, he sells the surplus in one of the nearest principal markets. His margin of profit ranges from 16 to 20 per cent. *Kochia* is a petty trader who moves from village to village and purchases in small lots on cash payment and then takes the quantity to the principal markets for sale. He works on a margin of 8 to 10 per cent profit.

The local trader buys from cultivators who bring their produce to him in cart loads. He is in touch with the rates prevailing in the principal markets and buys 5 to 6 per cent cheaper, and pays in cash. He is very unscrupulous in using false measures and making short payments. The traders who have permanently settled down at the principal markets purchase through *dalals* who charge from 12 annas to Re. 1 per cent as commission. The traders work as commission agents to big firms and consign direct. They operate on 2 to 3 per cent profit.

These traders are financed by banks or big bankers at 12 annas per cent interest. The purchased goods are stored in their (bankers') godowns.

(*c*) The marketing facilities may be improved on the lines given below. Co-operative purchase and sale societies may be organised:—

(i) Facilities for transport are very necessary and therefore district councils should arrange for more roads specially in the remote parts of the districts.

(ii) In each of the bigger markets there should be a managing committee of which two-thirds of the members should be agriculturists to safeguard the interests of sellers. The committee should arrange for the sale of goods by open bidding with due regard to quality and purity and should see that correct measures are used and prompt payments made. The committee can charge about four annas per cart load from the sellers as fee to meet their expenses. It is very important that the committee should have up-to-date information regarding prices ruling in other markets and for this a journal giving all the required information should be supplied to them. The system of sale by weight has much in its favour against sales by measures wherein a considerable loss to the seller is caused by wrong handling of the measure.

(*d*) More effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, crop returns, complaints as to Indian produce from wheresoever originating and agricultural and market news in general. This information may be issued in the form of bulletins written in easy and popular language which may be distributed widely through *patwaris* and schoolmasters.

Oral Evidence.

28315. *The Chairman:* Rai Bahadur Tundi Lal Powar, you are Deputy Director of Agriculture, Eastern Circle, Raipur, Central Provinces?—Yes.

28316. You have provided the Commission with a note of the evidence which you wish to give. Do you desire at this stage to make any statement or shall I ask you a few questions?—You may ask me a few questions.

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28317. Would you kindly give the Commission a short account of your technical training ?—I was first trained on the Nagpur farm and then I was put in chage of the Telinkheri farm. After that I was transferred in 1903 as Superintendent of the experimental farm here. I worked there for 8 or 9 years and then I was appointed as Extra-Assistant Director of Agriculture. I officiated as Deputy Director for three years from 1917 to 1920 and now again I have been officiating as such from 1923.

28318. Had you been a farmer before you commenced your education ?—Yes.

28319. Are you sprung from the cultivating class ?—Yes.

28320. I think you have probably heard most of the evidence which Mr. Plymen has given, have you ?—Yes.

28321. If there are any outstanding points on which you differ from him I hope you will tell the Commission ?—I do not differ; I quite agree with his views.

28322. What do you say on this question of the balance between the expense of demonstration and propaganda and that upon research proper? Do you feel that enough is being done in the direction of spreading the information already acquired by the research workers ?—No; we are not doing enough because we are short of hands and the number of Assistants and other staff we have got is not enough.

28523. I suppose what you would like to see would be no reduction in research and more money spent on demonstration and propaganda ?—Yes.

28524. Would you be prepared to see some reduction of research if the money could be spent on demonstration and propaganda ?—No.

28325. You would rather go steadily forward until the budget can be increased all round ?—Yes.

28326. Do you regard demonstration on the cultivator's own plot as the ideal method ?—Yes; but I think that should be done under the supervision of the agricultural officers.

28327. Is there any system in vogue in the Province according to which a cultivator is encouraged to make an experiment and, provided he follows the advice of the representative of the Agricultural Department, is guaranteed against loss ?—No; that system we have not adopted and we do not advise cultivators to make experiments. We make experiments on our experimental farms and only those methods which are found profitable by us are recommended.

28328. In your experience, is it better to attempt to demonstrate one feature at a time or do you think the cultivator is capable of going to a demonstration plot and deriving benefit from a series of experiments ?—We have different classes of cultivators here who could take advantage of demonstrations and so we proceed with all the work we have got in hand.

28329. You do not think that, where you have a thing of outstanding value to advertise, what I may call a single purpose demonstration is sometimes more effective ?—In certain cases it is more effective.

28330. I have very few questions to ask you at this stage because, having just examined the Director very completely, I shall only be repeating myself, particularly since you told us that in the main you agree with him. I should, however, like to ask you a question or two about fragmentation. Are you familiar with fragmentation of holdings ?—Yes.

28331. Are you familiar with the district in this Province where fragmentation is a serious problem ?—Yes.

28332. You probably have read a note provided for the Commission on this question of fragmentation ?—Yes.

28333. Are you hopeful that by working on those lines something may be done to mitigate this evil ?—Yes. We have not tried that system sufficiently; but I think if we proceed on the lines suggested by Mr. Dyer it is hopeful.

28334. But I observe that co-operation plays no part in the scheme ?—No. I do not expect anything from the co-operative movement in this respect.

28335. You do not expect co-operation to achieve anything in the direction of consolidation of fragmented holdings ?—No, because conditions here are quite different from those in other Provinces.

28336. In the Punjab, for instance ?—Yes.

28337. What do you say are the outstanding differences?—Here in one village we have got different situations and different classes of soils; we have got very small fields and if we proceed on the lines they have adopted in the Punjab, I do not think we will succeed.

28338. You could not satisfy the individual cultivator?—No.

28339. He has got various plots on different qualities of land and whatever you do for him he will feel he would be worse off than what he was before; is that the position?—Yes.

28340 *Sir S. M. Chitnavis*: You have got maps prepared showing the difference between the two places?—Yes.

28341. *The Chairman*: Upon this question of agricultural education, do you agree from your own experience that there is any sign of a growing demand for general education on the part of the cultivator for his boy?—It is very slight.

28342. But you think there is some movement?—Yes, there is.

That is precisely the impression that I have formed after listening to very many witnesses.

28343. Has there been in this Province an increase in the number of agricultural labourers and a comparative decrease in the number of persons holding land lately?—I think that movement is in progress because some cultivators who are heavily indebted have given up their lands and in this way a good deal of land has changed hands.

28344. That tends to bring various classes of land together under one name in the revenue records; does it?—No; what I mean is that, supposing a cultivator has got only a few acres and he is very heavily indebted, then the land passes to a well-to-do man and the owner takes to labour.

28345. My point is that the land passes to the man who is already holding land and the former owner works it as a tenant?—Not necessarily.

28346. But the shortage of agricultural labour remains as acute as it ever has been; is that so?—Yes; I think it is even increasing.

28347. Now there is a good deal of railway construction going on in this Province at this moment and there has been a good deal of development, probably within your recollection?—Yes.

28348. Now, looking at this question of improved communications and its bearing upon the marketing, do you think that cultivators in districts where communications have improved have tended on the whole to get a better return for their crops than they did before?—Yes.

28349. You feel pretty confident in your mind from definite cases that that is so?—Yes.

28350. You use the words: "I am not satisfied with the present system of marketing and distribution". Now leaving aside this question of the cotton markets in Berar, which the Commission will consider when they see the forthcoming report, what suggestions have you for improving the marketing?—I think the first difficulty is about communications. Now we have go the principal markets situated on the railway lines. The cultivators have to bring their produce from long distances to those markets, sometimes from 80 or 100 miles. In most cases there are no good roads and for want of good roads they cannot bring the produce to the principal markets and so they have to sell it to *banias* and other local traders who do not pay proper prices and who are very unscrupulous in making payments.

28351. I want to ask you one or two questions about crops. Do you feel that the dry crops in this Province do receive a fair amount of attention by this department as compared with the irrigated crops?—Yes; they do.

28352. Let me first ask you, are the pulses important crops?—Yes; we have not done much with regard to pulses.

28353. Would that be a very important line of work?—These pulse crops are not very important, in this circle at least.

28354. What about *jwari*?—It is not grown. On account of too heavy rainfall it is not possible to grow *juari*.

28355. *Sir Henry Lawrence*: Are you speaking only of this circle?—Only of this circle.

28356. *The Chairman*: What you said before is also to be interpreted in the same way?—Yes, I am only speaking of this circle.

28357. *Sir Henry Lawrence*: Have you no experience of the western part of the Central Provinces?—No, I have spent almost the whole of my service in this Division.

28358. And the whole of your evidence is restricted to this portion of the Central Provinces?—Yes.

28359. You say there is a shortage of labour; is that a shortage of labour only at certain periods of the agricultural season?—Yes.

28360. In other parts of the season there is sufficient occupation?—Yes, when the labouring classes cannot find sufficient work in connection with agriculture, they go to other works where they can find employment, for example, irrigation, Public Works Department, railways. A good many labourers emigrate to them.

28361. By means of that system of emigration there is sufficient employment throughout the year for anybody who chooses to take it?—No, I do not think so.

28362. For how many days of the year does a man who wishes to work have to sit idle because he can find no work?—That depends on the means of the man; supposing he is a cultivator and has got the means to engage all his time in cultivation, he can find work for himself for the whole year round. There are certain villages where they have only got *kharif* crops; in these villages an ordinary cultivator is busy on his holding from the middle of May to the end of January; where they have got both *kharif* and *rabi*, the cultivator is busy on his holding from the middle of May to the middle of March, and then after that period he is busy in improving his field *bunds*, levelling his fields, and so on. What I mean is that if a cultivator can afford to employ his time on his holding, he has got sufficient work; but in cases where they are too poor to employ their time on their holdings, they take to labour with other people or emigrate.

28363. And they can find that employment?—Yes, they can either find it locally or they go outside.

28364. That refers to the cultivating class?—Yes.

28365. Below that there is a landless class?—Yes.

28366. Do they find labour all the year round?—They find employment, there is no difficulty in that.

28367. In your answer to Question 6 (*a*) (i) you have given as the second main cause of borrowing the absence of occupation in the slack season?—Yes.

28368. How do you explain that, having regard to your last answer?—They are short of means; unless they have something or borrow, they cannot employ their time for their cultivation on their holdings, and so when they are short of funds they go and seek employment elsewhere.

28369. What percentage of the people do you suppose are unable to find employment throughout the year?—Do you mean the labouring class or cultivators?

28370. Whether labouring class or cultivating class, take it as you please?—I do not think I should be able to give you the exact figures.

28371. I want your own surmise as the result of your experience?—I think about 25 per cent.

28372. 25 per cent are unable to find employment all the year round?—Yes.

28373 For how many days in the year is that 25 per cent sitting idle?—I think from January to May.

28374. Four months?—Yes, 4 months in the year.

28375. Have you seen this memorandum* which has been supplied to us?—Yes, I have seen it.

28376. It is stated here that legal difficulties regarding the transfer of rights in the exchange of holdings are a considerable hindrance. When men wish to exchange their holdings and consolidate their area, there are certain legal difficulties?—Yes.

28377. Can you tell me what those legal difficulties are?—Supposing there are two cultivators who want to exchange their plots with each other, but the first cultivator has absolute occupancy right while the other is an ordinary tenant; when those plots are exchanged, the rights appertaining to those plots cannot be exchanged; that is the chief difficulty.

28378. Difficulties of tenure?—Yes.

28379. Is that a serious complication?—That is the serious complication.

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* See pages 153-160.

28380. Are not the majority of villagers in a particular village holding on the same kind of tenure ?—No, there are so many different tenures.

28381. In the same village ?—Yes.

28382. We are told that since 1905, 500,000 acres which were under minor millets are now put under rice or other more valuable staples ?—Yes.

28383. Has that been in any way due to the work of the Agricultural Department? —I think to some extent.

28384. It is an economic process ?—Yes, it is due to the work of the Agricultural Department and to some extent to the work of the Irrigation Department as well.

28385. I understand the area irrigated in the Province is 11 lakhs; what proportion of that 11 lakhs has been the subject of this improvement of crops ?—It would be more than one per cent I think.

28386. 1 per cent of the 11 lakhs ?— Now there is a tendency amongst cultivators to bring these inferior classes of soil under rice; before irrigation, these classes of soil were used for inferior crops but now as they have got irrigation, they are turning that land into rice land.

28387. Then are you hopeful that the cultivator, if he sees an improvement in cropping open to him, is ready to seize the opportunity ?—Yes, but the progress is very slow, I should say in this circle because the people are very backward and they are very conservative

28388. *Sir Thomas Middleton*: You point out that the schools are very poorly attended in this division ?—Yes.

28389. And you suggest that they should be used for teaching agriculture ?—Yes.

28390. Your method would be to attach plots of land to the schools and to introduce some agriculture into the text-books? —Yes.

28391. If the schools are poorly attended, how many of the boys in an ordinary village school would learn to read an agricultural lesson?—I think most of the boys, because in villages the boys who come to school are sons of cultivators or of other people who are closely connected with agriculture.

28392. But in an ordinary school how many children would there be: 30 or 40 boys ?—About 40.

28393. Of those, how many would be in the first class, the infants' class; would it be over 30 ?—About 10.

28394. Then your district must be different from other districts in India ?—Yes, but I am speaking about this circle.

28395. Do you think the boys stay on for four classes ?—By the time they reach the fourth class the number falls considerably.

28396. To what ?—They do not stay in the school till they pass the primary class.

28397. But in a school in which there are 40 children, how many would be in the first class ?—In the first class, the infant class, there will be about ten.

28398. Then there must be a greater number in the second class than in the third class ?—In the second class the number will be the same, but by the time they reach the fourth class the number falls.

28399. By the time they have finished the fourth class you mean ?—Yes.

28400. That is not the information we have had elsewhere ?—No, but the conditions here are different.

28401. So that you think you would have 10 or 15 boys in an ordinary school to whom you could teach some agriculture through the text-book ?—Yes, in the third and fourth classes we can teach it, but not in the first and second classes.

28402. Have you got any vernacular readers which have got agricultural lessons in them ?—I do not think we have got any.

28403. In order to make agriculture more attractive to middle class youths, you think that agricultural qualifications should receive more consideration than now when selecting candidates for the Revenue Department. You have yourself taken a B. A. ?—Yes.

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28404. So that you know the general quality of the B. A. students?—Yes.

28405. And in your opinion the revenue authorities would find as useful recruits among those who have been through the Nagpur Agricultural College as among the ordinary B. A's; is that your opinion?—I think so, yes.

Well, I hope the revenue authorities will listen to your view.

28406. Have light iron ploughs been introduced into this Chhattisgarh Division?—I think we have sold so far 300 or 400 ploughs.

28407. Of what type?—Mostly Meston and Jat. The Jat is just like the Monsoon plough.

28408. *Prof. Gangulee*: Where are these ploughs manufactured?—We get them from England; they are not procured in India. We tried some ploughs manufactured in India by Burn and Company, but the material was inferior and they did not give satisfaction.

28409. *Sir Thomas Middleton*: I have seen round the Chhattisgarh Division large droves of cattle. To whom do these droves belong?—To the cultivators.

28410. Have they been entrusted to herdsmen to keep for the winter months?—The whole village has got one or two graziers and he is in charge of the herd. He takes milk and is paid in kind.

28411. Are these cattle that we see round Raipur a fair sample of the cattle of the Chhattisgarh Division?—I think they are. As a rule, the cattle here are the worst we have got in the Province.

28412. I have read in evidence submitted to us that in the month of January the cattle are at their best in this Division?—They are in their worst condition in July.

28413. They are now at their best?—They are at their best in December and January, when there is some grazing to be had.

28414. *Sir James MacKenna*: How long have you been working on wheat?—Since 1915.

28415. What is the best wheat in your circle?—Pusa 100.

28416. In what way?—In yield and in quality.

28417. How does it compare with other wheats in this Division?—It gives 10 per cent more than the local variety.

28418. Does it command a premium in the market for quality?—Yes.

28419. Who introduced it in the division?—We got the seed originally from Pusa and compared it with other varieties, local and foreign, and found it to be the best.

28420. Did Mr. Howard pay you a visit in connection with its introduction?—Yes.

28421. *Prof. Gangulee*: Is there great scope for the introduction of subsidiary occupations in your circle?—Any occupation closely connected with agriculture, such as fruit and vegetable cultivation and garden crops, has some prospects.

28422. What facilities would be required for their introduction?—Irrigation facilities and financial help.

28423. Is the co-operative movement strong in your circle?—No.

28424. It does not help in the matter of subsidiary occupations?—No.

28425. Do labourers who migrate come back to your circle in any numbers?—Only a small proportion of them.

28426. After they come back do they take up agriculture?—If they have the money; otherwise they become labourers.

28427. Do you know any labourers who have come back?—Yes.

28428. How does their standard of living compare with that of those who have not migrated?—There is some change. They are better clothed and their mode of living has improved.

28429. How long have you known this circle?—For the last twenty-three years.

28430. Have you found any decided change in methods of cultivation during that time?—Yes. The people have taken to new crops, such as ground-nut and improved varieties of sugarcane. They are now using improved varieties of paddy and wheat and there has been a decided improvement in field embankments and so on.

28431. Is indebtedness increasing?—I think it is.

28432. What about the standard of living?—It is improving, but not rapidly.

28433. *Mr. Kamat*: How many demonstration plots have you in your own circle?—Three; we are opening four more this year.

28434. So the Deputy Director has only four plots to look after?—He has other work as well. He is directly in charge of the experimental farm and supervises the subordinate staff.

28435. How many *kamdars* have you to look after these four demonstration plots?—One for each plot.

28436. Do you think you are understaffed?—Yes, because we want more demonstration plots and for each we require at least one man. Unless we have one demonstration plot for each Revenue Inspector's circle we will not have much influence on the cultivation of the district.

28437. Have you any experience in regard to consolidation?—Very little.

28438. *Sir S. M. Chitnavis*: Can you tell us something about the methods of the Irrigation Department here and whether it is popular with the cultivators?—The best person to tell you that would be someone connected with the Irrigation Department. People sometimes complain about the rates, but there is not much there to complain about. They also complain of the small supply of irrigation water.

28439. Some years back certain fodder reserves were started in this division. Are they still going on?—We have transferred four fodder reserves to private individuals on easy terms, and they have started cattle-breeding under the instruction of the Agricultural Department.

28440. How many reserves have you altogether?—We had eleven in all, four of which have been leased to private individuals and five are in our charge. The rest are still under the District Council.

28441. *The Chairman*: Do you think there is room for some extension of minor irrigation schemes in the district with which you are familiar?—Yes.

28442. Do you think there are schemes which the cultivator might carry out at his own expense and risk if he had expert advice?—Yes, but most of the people are too poor to undertake them.

28443. Could they be undertaken as co-operative schemes?—Not for some years to come.

28444. That stage has not been reached?—No.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Tuesday, the 18th January, 1927.

Tuesday, January 18th, 1927.

RAIPUR.

PRESENT :

The MARQUESS of LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO of PARLAKIMEDI.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.
Mr. C. U. WILLS, I.C.S.
Sir SHANKAR MADHO CHITNAVIS, KT., I.S.O. } (*Co-opted Members*).
Mr. J. A. MADAN, I.C.S.
Mr. F W. H. SMITH. } (*Joint Secretaries*).

Mr. RAMCHARAN LAL DUBEY, Waraseoni, Balaghat District.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) and (ii) There is one Agricultural College at Nagpur and two vernacular agricultural middle schools were opened, one at Hoshangabad and the other in the Raipur district. The latter has been closed. I have no information how the Hoshangabad school is working. The supply of teachers for the above two institutions is sufficient. As regards the question whether there are sufficient institutions or not, it will be admitted on all hands that there should be many more institutions for teaching agriculture, but I think it is yet to be ascertained of what type the agricultural school should be.

(iii) It should not matter whether the teacher belongs to the agricultural or non-agricultural class so long as he imparts practical training also.

(iv) Men turned out from the Nagpur Agricultural College take up service in the Agricultural Department. Considering this the attendance at the College is good enough. It is a plain fact that it will not pay a small or even an average farmer to undergo such a long and costly course of training as his farm will not offer adequate prospects for his qualifications. Owners of big farms will be well advised to take the college course, but the tendency of such men, if they go for collegiate education is to go to arts and law colleges and to take up services in other Government departments or do some other profession, as agricultural work is disagreeable to them and they also think that it will not pay well.

(v) and (vi) Students in the Agricultural College are mostly non-agricultural class men. They go there for qualifying themselves for service. If agricultural service is not available, they seek some other department and would go to agriculture as a last resource.

(vii) The two present courses at the college are all right, but men who want to do private farming, should have more practical experience of the cultivation of profitable crops suitable for the tract where they want to work and for this purpose the student after passing out from the college should be given thorough practical training on a Government farm for at least two years. The particular branch in which he is to be trained should be placed in his sole charge and he should also maintain its account to convince him more about the profits.

(viii) (*b*) School plots will be useful additions to the existing primary schools in rural areas, in which vegetables and flowers should be grown and all work done by the teachers and pupils themselves.

(*c*) School farms will not bring the desired result in primary schools as the boys in these schools are too young. As adjuncts to the existing English middle and high schools, I do not think they can be of any good. The students

in these schools are mostly non-agricultural class men, whom it will be futile to expect to change their social customs and take up farming as a profession for the family.

(ix) Almost all the students from this Province who passed out from the Nagpur Agricultural College have taken up service in the Agricultural Department.

(x) The present agriculture entails much hard and rough work and a man is more comfortable in other professions. It is also not remunerative. Means of substantially increasing the outturns and labour-saving devices will attract educated men to do agriculture.

(xii) and (xiii) Education in vernacular should be aimed at. Every village should eventually have a school and a library. The teacher should lecture the adults in their spare time until all the villagers learn reading and writing and get fond of reading. Boys of school-going age should be taught in periods suitable to them. Even an evening class might be held so that boys may be able to work for their parents as well as read. The teacher should be a trained man in agriculture. So agricultural training should be introduced into the normal schools, where vernacular teachers are trained. In every district, there should be a vernacular middle and normal school combined and it should have a farm attached to it. In addition to the present teacher's course, agriculture should also be taught. All vernacular teachers should be recruited from such schools as well as agricultural *jamadars* and *kamdars*. *Patwaris* may also be recruited from these schools. The tendency of the people is to take such courses of training, which guarantee a service. So such an institution will attract men and as the jobs to be offered, *viz.*, of vernacular teachers, agricultural *jamadars* and *kamdars* and *patwaris* are low paid ones, men will surely be fit to earn more in agriculture and will be attracted towards it. The cost of such institutions will not be so high that funds for them will not be found.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Opening of Government farms and demonstration plots, agricultural shows held on farms and in fairs, field demonstrations and forming of Tahsil Agricultural Associations are the measures, which have influenced the improvement of the practice of cultivators.

(*b*) To increase the effectiveness of field demonstrations, help of the malguzar or a leading and most influential cultivator in the village should be secured. I think such men will be drawn to the side of the Agricultural Department if they be paid for the trouble they will take. They may be made members of the Tahsil Agricultural Association and paid travelling allowance for attending the association meeting as well as for the time they will spend with the agricultural officer, while he is on tour in the member's circle. To begin with there may be one member from each *patwari* circle.

It is also necessary to increase the number of Government farms. There should be one experimental farm in each district, a demonstration farm in each tahsil and two or three demonstration plots in each Revenue Inspector's circle. Apart from this, it seems desirable that some tangible help should be given to enterprising men, having agricultural qualifications, who are desirous of doing farming on improved lines. This should be in the form of a subsidy from Government as the activities of such men are greatly handicapped for want of funds. Improved farming by such men will go a long way in removing the apathy and convincing the cultivators of the advantages of improved farming. The money thus spent would, therefore, be more than recouped.

Men of ripe experience in the different grades of the Agricultural Department, desirous of carrying on private farming may be allowed to retire on proportionate pension. They may also be helped as suggested above by the grant of subsidy or loan on easy terms in starting their private farms. In my opinion, this will be a better step than encouraging fresh men from colleges to do private farming, as these men will be liable to commit mistakes through inexperience.

(*c*) Members of the Tahsil Agricultural Association should meet on a farm instead of in the tahsil court and at such times that they can be best impressed about the crops and the improvements made. As suggested in a preceding paragraph, if payment of travelling allowance is introduced, the attendance in the meetings will improve. The aim of the Agricultural Department should be to introduce improvements on the farms of the association members first and from there they will spread most quickly in the whole village. To provide for the expenditure to be incurred in the payment of travelling allowances to members, a small cess of about half an anna per rupee in the land revenue may be levied.

MR. RAMCHARAN LAL DUBEY.

(*d*) As a result of the efforts of the staff of the Agricultural Department, *bhondu* and *luchai* varieties of improved paddy which are at least 10 per cent better than the local varieties have been introduced in areas visited by them. In this district about 1,800 M. S. N. ploughs have been supplied by the Agricultural Department within the last three years. The M. S. N. plough is better for rice cultivation in light soils than the wooden plough. In place of the local *mangi* and *kathai* varieties of sugarcane, the better yielding *khari* variety has been introduced and this variety is now being replaced by the improved Coimbatore cane varieties. The *Jat* plough has begun to be used for sugarcane cultivation. The Nahan cane-crushing mill which gives 20 per cent more extraction than the local wooden mill is now to be seen everywhere. The improved *gur* boiling furnace, owing to its easy feeding offers relief to the much troubled *gur* boiler. Other minor improvements affected through the activities of the Agricultural Department are too many to be mentioned. Efforts are being made by this department for introducing the use of oil-cake and fertilisers, *viz.*, nitrate of soda and sulphate of ammonia as manures for sugarcane. It is noticeable that progress is much handicapped owing to paucity of staff of the Agricultural Department.

In the matter of animal husbandry, stud bulls reared at Government cattle-breeding farms are so much in demand that it is difficult to supply the required number of bulls unless many more bulls are turned out from the Government cattle-breeding farms.

QUESTION 4.—ADMINISTRATION.—(*c*) (i) The Agricultural Department is trying its best to improve the practice of the cultivators by carrying on research work on experimental farms and in laboratories and introducing the improvements through the medium of the demonstration staff. The demonstration staff is confronted with the difficulty that leading cultivators do not help in the work as much as they can and this difficulty will be solved by drawing them to the side of the Agricultural Department by paying them allowances to come to meetings and to go out with the agricultural officers.

The services rendered by the Agricultural Department considering the small staff available may be looked upon as fairly satisfactory. It is, however, necessary to have a much greater expansion of the department for the real benefit of the country. As the superior services are to be Indianised, it would be desirable to send suitable men for training to more advanced countries.

The other cadres of the department should also be greatly expanded, the aim being to ultimately have an Extra-Assistant Director for each district, an Upper Subordinate for each tahsil and a Lower Subordinate, assisted by two or three *jamadars* in each Revenue Inspector's circle.

The subordinate staff had better be better paid than at present, especially in respect of travelling allowances, which are too meagre at present even as compared with those of any other Government department. The duties of a demonstrator entail much hard and rough work and a most irregular life. Increase in allowances will enable him to keep himself well equipped.

The veterinary staff should mix with the cultivators more than they do at present and, I think, try to train people in using simple medicines as well as in preparing locally available medicines.

QUESTION 5.—FINANCE.—(*a*) Loans should be given to the cultivators on a much greater scale than at present. They will fall under one of the following heads:—(1) for seed; (2) for carrying on the seasonal operation; (3) for manure; (4) for implements; (5) for bullocks; and (6) for making improvements.

Loans under (1), (2) and (3) will be short-term loans. In order that the cultivator may not handle money, seed, manure and implements will all have to be supplied through the Agricultural Department as at present but on a much greater scale. Seed can be supplied from Government farms and seed farms. For the supply of manure and implements, the supplying firms may open credit accounts with the Agricultural Department and payment made to the firms on recovery of the amount from the cultivators. Loans in cash will be in the case of items (2), (5) and (6), and officer recommending the loan should see that the amount is rightly spent by the cultivator. I think Government should take this question in their own hands. A bank should be opened and loans given on the recommendation of the Agricultural Department.

(*b*) The *taccavi* rules should be relaxed on the following points:—

The present procedure is a lengthy one and much time is taken from the time of applying till money is paid to the applicant.

The respectable cultivators would not like to give so much publicity to the matter as is at present the case.

The cultivator wants to keep a sort of continuous account with his creditor.

When *taccavi* falls due, but the cultivator fails to pay, the cause should be ascertained and a reasonable time allowed before taking coercive measures for recovery.

Existing rate of interest should be lowered, if possible.

Granting of *taccavi* loans on the recommendation of the Agricultural Department for seed, manure and implements is working better as the cultivator does not handle cash. The system ought to be greatly expanded and loans for all agricultural purposes should be given on similar lines.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main cause of borrowing is the cultivator's accumulated debt. Occasional high expense in social customs also compels him to borrow at times.

(ii) The main source of credit is the moneylender.

(iii) Causes preventing repayment are high rate of interest, seasonal reverses, sometimes calamities like cattle diseases, etc.

(*b*) I think cultivators should not have to do anything with the moneylender any longer. The present debts should be settled by appointing special officers for the purpose and easy instalments fixed for repayment. Hopeless cases may be declared insolvent. A bank should be started forthwith for advancing money to cultivators.

(*c*) From the past experience as lands have passed from cultivators' hands to moneylenders', the right of mortgage and sale should be limited. There should also be nothing like a non-terminable mortgage.

Consideration should, however, be given to the fact that exploiters always expect that the land should have a saleable right, and I think absence of such rights also keeps back men qualified in improved agriculture from starting agricultural concerns.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) It is highly desirable that the size of holding for rice should not be less than 4 acres. So sub-divisions beyond this limit should be prohibited.

(*b*) Consolidation will be a most valuable move. In the Balaghat district, the fields of a cultivator are not so scattered as in Chhattisgarh. There are blocks but a man has more than one block in many cases and in such cases consolidation might be possible by arbitration. If not, legislation may be introduced.

QUESTION 8.—IRRIGATION.—(*a*) There are big irrigation works in this district belonging to Government as well as many private tanks and wells. Wells can be improved considerably. Well irrigation is done in light soils on river banks, where subterranean water-supply is ample but the wells are *kutcha* and in most cases are dug annually. The lift used is the leather *mote*. In place of this outfit, there should be *pucca* wells, which will be most easily sunk. At present, people do not know well sinking and this work had better be taken in hand by the Engineering Section of the Agricultural Department. Power lifts and pumps and Persian wheels may be introduced in place of the leather *mote*. By making the wells *pucca* and fitting up improved lifts thereon, the wells will not have to be so many, irrigation will be cheaper and will extend considerably.

The irrigation works belonging to Government are the Wainganga Canal, the Pathree Tank, the Sarathee reservoir and many other minor ones. Most of these works can irrigate the rice crop all right but the supply of water available in the first three major works is not made full use of. The Irrigation Department is not popular enough. No efforts have been made to find out the cause of unpopularity and to find out how best the water can be utilised. Under the Wainganga Canal, remunerative crops like chillies and turmeric could be grown and under the Pathree Tank, there is much scope for the extension of sugarcane cultivation.

As regards irrigation from wells, people have no idea that their wells and lifts can be improved.

(*b*) At present, only rice is irrigated. If rainfall is well distributed, little or no irrigation is necessary as was the case in the last season. Otherwise, when there are long breaks in the rains irrigation is done. But such periods are not peaceful. People at the tail end and at distances from the channel do not

generally get water and are dissatisfied. There are at times serious disputes among the cultivators for this reason.

In rice irrigation, no method of conserving water or preventing it from absorbing in the soil is feasible except by making the *bunds* intact and big enough. *Bunds* in this district are good enough. In the matter of sugarcane irrigation, a start in this direction has been made by intercultivating the crop by means of the Planet Junior hoe.

The openings in the irrigation channel require much improvement. Even at the head sometimes the supply of water is unreliable as anybody can silently put an obstruction in the open mouthed opening. I know of openings which have become permanently useless for this reason.

The rules of the agreement system for rice irrigation should be relaxed in cases in which irrigation water has not reached owing to the absence of a water course or short supply of water but where such areas are nevertheless fully assessed, steps should be taken to get water-courses made by the cultivators and in cases where too much work is to be done, which it will not pay a cultivator to do or is unmanageable by him, the Irrigation Department should do it or at least help in the construction. There is dissatisfaction in assessing cultivator's old wet areas and such cases should be reconsidered.

In the introduction of new crops under irrigation works, a stable policy is not defined but crops are introduced entailing much expense to the cultivator and then stopped.

QUESTION 10.—FERTILISERS.—(*a*) Cowdung is mostly used as fuel. This could be remedied by planting trees for fuel. Bones will be most profitably utilised if they are crushed and used as manure instead of being exported.

(*b*) Fertilisers are used only to a small scale for manuring sugarcane. To prevent adulteration they should be supplied from depôts on Government farms after being analysed. At present, business in fertilisers has not so much increased that farm depôts will not be able to manage it.

(*c*) If the fertilisers could be made cheap enough so that it will pay to use them, they will be used more than at present.

(*e*) I think the manures have been tested on Government farms and the conclusion drawn is that with the present prices it does not pay to use them except for profitable crops like sugarcane, potatoes, etc.

(*f*) Trees for fuel should be planted. In my opinion, plantations of *karanja* trees should be started by the cultivator himself in small areas. Out of every five or six acres, an acre should be planted with *karanja* trees, which when big enough will give sufficient manure for the remaining area as well as the requisite fuel. This should work well in wheat tracts also as the leaves and twigs of *karanja* will be available for ploughing in just in the beginning of rains. In wheat lands, it is not possible to plough in *sann* early enough and so it does not rot but *karanja* leaves as stated above will be available for ploughing in the beginning of the rainy season. I understand in the Madras Presidency manuring with *karanja* leaves and twigs is practised.

I am of opinion that the outturn of rice will increase considerably by manuring with *karanja* leaves and cattle-dung which will be saved by the supply of *karanja* wood for fuel. In highly manured land, rice yields as much as 3,000 lbs. of grain per acre but the cultivator's outturn is only 1,000 or 1,200 lbs. per acre on an average in his unmanured land and may still go lower if no manuring will be done.

QUESTION 11.—CROPS.—(*a*) (i) Wheat, rice and cotton crops have been improved considerably by selection and crossing carried on on Government farms and this work had better be done on a bigger scale and at more places than at present.

(ii) Fodder crops are at present grown on some of the Government farms. It will be better if on all Government experimental and demonstration farms trials were made to find out fodder crops suitable for the different soil and climatic conditions which cultivators can take up. The cultivation of clover should be encouraged by supplying the seed to leading cultivators first free of cost, then at concession rates until they know its value.

(iii) If suggestions regarding paying allowances to members of the Tahsil Agricultural Association as made in reply to Question 3 (*b*) are given effect to, the best agency for increasing the growing and distribution of improved seed will be the member of the Agricultural Association.

MR. RAMCHARAN LAL DUBEY.

(iv) For the prevention of damage from wild pigs, cultivators should be induced to fence jointly.

(*b*) Late and heavy yielding varieties of rice should be introduced in areas commanded by the Wainganga Canal in place of the early and medium ones, as under that work there is an ample supply of water available from middle of June to end of March every year. Water from middle of June to end of October is used for irrigating rice crop but from November to March it goes to waste.

(*c*) Heavy yielding varieties of rice, *viz., bhondu and luchai,* have been introduced through the efforts of the Agricultural Department in tracts visited by the staff of that department. *Khari* variety of sugarcane, which is better in yield than the local variety has replaced the latter in areas tackled by the Agricultural Department.

Since the opening of the Wainganga Canal, large areas of land, which used to grow inferior millets, have now been turned into rice land, and are now producing more valuable crops than before the opening of the canal.

QUESTION 12.—CULTIVATION.—(i) The M. S. N. plough is a good supplement to the existing implements for rice cultivation and the introduction of that plough is successfully being carried on by the Agricultural Department. The use of the Jat ploughs for sugarcane and garden cultivation should be demonstrated on a bigger scale than at present.

(ii) A little change is possible by introducing clover as a second crop after rice in irrigated areas under the Wainganga Canal.

QUESTION 14.—IMPLEMENTS.—(*a*) A small power sugarcane mill suitable for small cultivators workable by a 2 B. H. P. oil-engine is now most urgently required. The material of the mill will have to be very strong as hard canes are grown on this side. In the meantime, the Nahan bullock power mill should be worked by a small oil-engine of 1½ or 2 B. H. P. as this mill has been found to be the best for crushing the hard canes. The power cane mills, of which I have experience, are too big for small cultivators and not strong enough for dealing with the hard canes.

There is considerable scope for the expansion of sugarcane crop in the Central Provinces as water is available from Government irrigation works. The only trouble in the expansion of the crop is the absence of a suitable power mill.

It may be mentioned here that the local supply of *gur* is too short and it has to be imported in large quantities from the United Provinces and Madras and Bombay Presidencies.

(*b*) Suggestions have been made already regarding paying of allowances to the Tahsil Association. Members will be useful in this connection also. If the member will be convinced about the superiority or usefulness of the implement, there will not be any difficulty in the adoption of it by the cultivators of that village.

QUESTION 15.—VETERINARY.—(*a*) I think no good will come by placing the Veterinary Department under the Director of Agriculture. Veterinary Surgeons may be appointed by the Agricultural Department for work on cattle farms and these officers may work under the Director of Agriculture.

(*b*) (i) and (ii) Veterinary dispensaries are under the control of District Boards. No expansion is noticeable in the number of dispensaries.

(*c*) (i) The veterinary dispensaries are not within easy reach of the cultivator. I think a system of treatment should be devised to help the cultivator near his place.

(ii) I do not think touring dispensaries are being fully used except at the time of outbreaks, if then the Veterinary Assistant Surgeon happens to reach the place in time. I think it will be better if some medicines are left with the malguzar of the village and he is trained to use them when necessary. The Veterinary Assistant Surgeon goes to a village when there is no work for him; or if there is sickness and treatment is to be continued he cannot afford to stop there and continue the treatment.

(*d*) On receipt of information about an outbreak, he goes to the village and if the villagers do not agree to inoculation, he is helpless. Information of an outbreak must come to the Veterinary Assistant Surgeon without any delay. I do not think segregation will be possible until spare cattle sheds are made in remote corners, so isolation and disinfection should be resorted to for the

present. There should be legislation for the disposal of diseased carcasses and compulsory inoculation. Prohibition of the movement of cattle will not be possible.

(*f*) Inoculation is done at the time of outbreaks. Some people agree to it. Others do not. No fee is charged for inoculation.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Breeds will be improved by selective breeding. A start has been made by the Agricultural Department by rearing bulls on Government farms and supplying the improved bulls to cultivators. But the number of bulls available is too small to meet the demand. So this work should be expanded much.

(iii) Breeding proper goes on in uncultivated areas owned either by Government or Indian States and from these sources mainly the supply of work cattle in these Provinces is received. In such areas, conditions could be introduced that only selected cattle will be admitted and that a certified bull should be kept. Breeding also goes on on a small scale on lands owned by private individuals to whom should be explained the advantages of selective breeding and they will readily take to the use of better bulls and will also agree to castrate their bad bulls.

When the stage is reached when certified bulls are available, legislation could be introduced to castrate all bad bulls.

(*b*) (i) Overstocking of common pastures will decrease with the extension of cultivation, as the cultivators will not then keep extra and useless cattle. I think limitation should be introduced as to the number of extra cattle a cultivator could keep.

Non-cultivators in villages should not be allowed to keep many cattle. In some cases non-cultivators own herds and graze them on pastures meant for plough cattle.

(ii) I think it should be left to the cultivator to take care of his grass borders.

(iii) With the increase in the outturns of crops, the supply of straw can also increase.

(iv) I think the difficulty of absence of green fodder in dry seasons cannot be easily solved.

(*c*) The shortage of fodder is acute in the months of May, June and July. Young cattle suffer a set-back in the above stated months and begin to revive in August.

(*d*) If hay be made in forest areas as cheaply as possible and means of transporting it improved, the fodder-supply will be improved.

(*e*) The above points should be discussed in meetings, in which attendance can improve if members be given travelling allowances.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) and (*b*) In the tract, where I am, I should say cultivators are not idle. They are very busy in June, July and August in rice cultivation. In September and part of October they have to cut grass for their cattle, which are mostly stall-fed. In November harvesting goes on. December, January and February are threshing and rice pounding months. In March, they deal with the little *rabi* they have got. In April and May, there is light work. In these months, cultivators improve their *bunds*. They are much hard pressed at the time of transplantation and have also to work hard at harvest times, when they require help of their families also. The few who have taken up sugarcane cultivation pass a very busy time. The families of respectable cultivators cannot be expected to do any other work than agricultural on their own farms, for increasing their income.

No other industries except agricultural such as fruit and vegetable growing should be attempted, otherwise the cultivator will slacken his interest in agriculture and may in course of time leave it. In places where *bidi* making has started, agricultural labourers have turned into *bidi* makers.

(*c*) Out of the industries mentioned, fruit growing will be a general line for the cultivator and with it should go vegetable growing also. Bee-keeping has no future. Poultry rearing will be useful for those castes which have no social objection in the matter but it is worth while taking steps to introduce improved poultry rearing. Lac culture already goes on in places suitable for it. The cultivator makes his ropes all right. Basket making is restricted to a particular caste and will not be a general line of work.

(*d*) I do not think Government should establish oil pressing, sugar making, cotton ginning and rice hulling. These may be left to take their own course. Wheat and rice straw and cotton seed are cattle foods, of which there is already a shortage. No attempt should be made to use them otherwise.

(*e*) There are already weavers, basket makers, carpenters, blacksmiths, masons, etc., who carry on agriculture as a subsidiary industry.

(*f*) Steps may usefully be taken to study the rural industries and to introduce improved tools and appliances.

(*g*) Much can be done by improving the present wells and lifts. In many places, the subterranean water-supply is not made use of.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) In the Balaghat district, there is no necessity of taking any such steps. Labour is most in demand here at the time of transplantation in the months of July and August. Wages go very high at that time, so labourers are attracted from other places in the district, where rice is broadcasted.

(ii) Cultivation can extend in ryotwari lands in the Baihar tahsil of this district. I think proprietary rights on the land should be conferred in these areas to encourage immigration therein.

(*b*) In this district manganese mines have been opened, to which labour has been attracted and shortage of it is felt in the vicinity of the mines. Labour, however, returns to villages in the rainy season and is available for rice work. It will be sufficient to see that mines do not employ village labour in the months of July, August and November, when it is required for transplantation and harvesting of rice.

(*c*) Uncultivated lands are found mostly in ryotwari villages. Only tenancy rights are conferred on such lands. Conferring proprietary rights as suggested already might attract people to such areas.

QUESTION 20.—MARKETING.—(*a*) Under the heading of marketing, I can only say that the markets are overflooded at harvest times and prices are lowest at that time as cultivators sell off all that they have to sell for the payment of land revenue, irrigation charges and payment of debts, etc. I think the dates of payment of land revenue and water rate should be so changed that the cultivator will be able to store his produce and bring it into the market at two or three times in the year instead of the whole of it at one time. By doing so, prices will not fluctuate so much and the cultivator will obtain better prices for his produce.

QUESTION 23.—GENERAL EDUCATION.—(*a*) In the matter of education, I am of opinion that no radical change in the courses of the present system of elementary middle school and higher or collegiate education is necessary. There must be two sides of education, *viz.*, (1) that for the sake of learning, and (2) professional. The education imparted in high schools and colleges belongs to the former type and considering the learning, which it has spread in the country, it cannot be condemned.

However, attention has to be paid to the professional side of education. I think introduction of agricultural education in the English middle or high schools will not do any general good. On the other hand, it might act as a deterrent of the non-agricultural class men who read in these institutions for the sake of learning or qualifying for some public services or professions other than agriculture.

Agricultural class men are also not to be expected to take higher forms of education in English in view of the low prospects present agriculture offers them.

So agricultural education should be imparted outside the present educational institutions and there must be higher and lower grades of it. The present agricultural colleges are all right for higher agricultural education and the introduction of agriculture in the vernacular middle and normal schools as proposed by me in my replies under Agricultural Education will be suitable for a lower form of agricultural education, which small and average cultivators may be expected to undergo.

(*b*) (i) On leaving the primary schools, a student is liable to go back to illiteracy if he does not keep his practice of reading; so there should be libraries in the villages and suitable literature in such libraries.

(ii) In this district, compulsory education has not been introduced in rural areas. Nor do I think will such a step be possible for poor men as they are

not able to support the small boys of school-going age who have to work for their parents or earn their livelihood.

(iii) The small proportion of boys in rural primary schools is due to the fact that men passed out from these schools have not proved themselves better cultivators in any respect. They are, however, more intelligent and nobler than illiterate men and everybody aspires to have his children educated. Poverty and insufficiency of primary schools, I think, are the causes of the slow progress of education in rural areas.

Oral Evidence.

28445. *The Chairman:* Mr. Ramcharan Lal Dubey, you are from the district of Balaghat?—Yes.

28446. What is your occupation?—I am a cultivator. I am a retired Agricultural Assistant.

28447. You are a retired officer of the Agricultural Service and are you cultivating land yourself?—Yes.

28448. How many *bighas* are you cultivating?—I have 35 acres of land.

28449. *Sir Ganga Ram:* How much is a *bigha* here?—The term *bigha* is not known in these parts, but I think 2/5ths of an acre make one *bigha*.

28450. *The Chairman:* What type of cultivation do you have?—My main crop is sugarcane.

28451. Irrigated?—Yes, under the Pathree Tank which has a perennial water-supply; I have also a plot of 11 acres where there is well irrigation.

28452. How long have you been cultivating this land?—For the last four years, although I retired only two years ago.

28453. Did you introduce the cane or was the cane cultivation in existence before you took up the land?—There was no cane cultivation. The Government farm was started 10 years ago and there was no sugarcane under irrigated tanks: that was the first. In the beginning the people took to sugarcane but gave it up. The starting of my farm has given some stimulus to the cultivators and they have now been increasing their area year by year. The area last year was 50 acres under that tank and this year it has risen to 70.

28454. What canes are you planting?—I started with *khari* cane. The year before last I introduced Coimbatore cane also on my farm; I had only about half an acre and it gave a very good yield. Last year I grew 5 acres. The crop was crushed this season but I found the canes a bit too hard and I do not think that I will be able to keep on with it.

28455. Is that because you have not a mill suitable for crushing Coimbatore cane?—Yes.

28456. You state in your note that a power mill is also needed?—Yes, I am at present crushing with a bullock mill and this is not suitable for Coimbatore cane.

28457. *Mr. Calvert:* An iron bullock mill?—Yes.

28458. *The Chairman:* Which Coimbatore cane are you using?—210. The Agricultural Department recommended 210, 219 and 226, three varieties; 210 is an early cane; I have a small area of 219, but this is a late cane; 226 suffers a little from defective germination. I have much of 210, about half an acre of 219 and half an acre of 226.

28459. What is the soil?—My soil is sandy in one field; the other field which is commanded by the irrigation tank is a sort of alluvial soil.

28460. I understand from your last answer that your water-supply comes from a tank?—Yes, for half the area it comes from the Government tank; for the remainder I lift the water from a well.

28461. By bullock power?—Yes.

28462. Did you sink the well?—Yes, I had sunk the well myself and I have to repair it every year. In the first year I used the leather *mote*, then I ordered a Persian wheel from the Punjab.

28463. *Mr. Calvert:* An iron Persian wheel?—Yes. The people did not know of it but on my ordering it some four or five men also ordered it and are using it.

28464. *The Chairman:* So that your example has been followed?—Yes.

28465. Are you satisfied with the working of the Persian wheel?—Yes. It has a better lift than the *mote*.

28466. What did it cost you by the time you had put it up?—I had to pay Rs. 180 (that is to say, Rs. 160 cost price and Rs. 20 for railway freight). But my experience is that the well keeps slipping.

28467. *Sir Ganga Ram:* What would it cost you to make the well *pucca*?—The soil is sandy and I am not myself a mason. I asked some masons to construct the well but they said it would not be possible to go deep enough. The well should be sunk deeper as a matter of fact, but nobody knows how to do it.

28468. *The Chairman:* At what depth did you find the water?—Only 12 feet below the surface.

28469. How deep do you think the Persian wheel will work?—I am told that it can work up to 30 feet; it gives very satisfactory work at 20 feet depth.

28470. Would you tell us a little of your own experience in the matter of manuring your canes? What manure are you using?—I use oil-cake and ammonium sulphate, a combination of the two.

28471. And that has given good results?—Yes.

28472. Are you putting any cattle manure into the land at all?—It is not available. My own cattle-dung is not sufficient for my requirements and the shortage has to be supplemented by these artificial manures.

28473. You have provided us with an interesting note of the evidence that you want to give. May I ask you one or two questions on that or would you like to supplement your written note by any statement at this stage?—No.

28474. How long were you in the Agricultural Service?—For 20 years.

28475. What grade did you reach?—I was in the subordinate grade all along.

28476. Did you yourself do any propaganda work?—I served in certain capacities, as Farm Overseer in the beginning, as an Agricultural Assistant on demonstration duty, as Superintendent on three big farms of the department and as Superintendent of the biggest cattle-breeding farm in the department.

28477. What form of propaganda do you think is most effective in persuading cultivators to adopt improved methods of crops? Demonstration on farms controlled by the Government or demonstration work on the cultivator's own holding?—We must work through the leading cultivators.

28478. To persuade the leading cultivators to make a change so that their example may be followed by the smaller men?—Yes. That is what I noticed in my own case.

28479. Have you ever considered the possibility of Government, through the Agricultural Department, taking the risk of experiment off the shoulders of certain selected cultivators, that is to say, guaranteeing the cultivator against loss if he attempts a particular experiment or introduces some new crop?—The cultivator will not take to anything new unless he is satisfied that it is advantageous.

28480. That is because he cannot afford to take any risks, is it not?—So far he has not been able to try anything. He has only been advised to take up things which have been found advantageous by the Agricultural Department.

28481. You do not think that the existence in the culivator's mind of the possibility of risk is really what deters him from a more progressive policy?—At present to an average cultivator, say to the small cultivator, there are not many things to be told, except a change of seed, implements, or manures if he takes to garden cultivation, and a few other items.

28482. *Prof. Gangulee:* Chiefly pure seed?—Pure seed, implements, and in some cases improved methods of cultivation.

28483. *The Chairman:* Were you on the land before you went into Government service?—No, I belong to the non-agricultural class.

28484. Do you think that you see amongst cultivators any demand for general education for their sons?—Yes, they do aspire to education for their sons, but they cannot afford it on account of the schools being at a distance from their homes. Moreover, the boys have to work for their parents.

28485. We were told by a previous witness of, I think, wide experience in this district, that he thought he saw only a very slight movement amongst cultivators in favour of education. Would you agree with that as a fair statement of the case?—That might be the case in this Division. The people are more backward here than in my district; I have noticed that there the cultivators do aspire to education for their children.

28486. Now with regard to your suggestion that officers of the Agricultural Department should be allowed to retire on proportionate pension if they wished to take up private farming, is it your suggestion that it would be practicable to insist upon their taking up farming as a condition of their enjoying proportionate pension?—Yes. Some officers may wish to do their own farming for want of better prospects in the department, or it may be that they would like their own farming better than service. They are tied to the department because they cannot retire unless they have finished their service.

28487. You have had very considerable experience of Government cattle farms?—Yes.

28488. Are you satisfied with the efforts being made by Government at this moment?—Yes, very valuable work is being done.

28489. Do you think it is on a sufficiently large scale?—I do not think so; it must be multiplied many times over.

28490. Do you think that there exists amongst cultivators any appreciation of the importance of improving their cattle?—Yes, from the fact that the few bulls which are produced at these farms are sold off most quickly and the demand is not met for want of a sufficient number of bulls.

28491. Is it of very much use improving the breeds of cattle in this Province if they are not to be better fed than they are at the moment? Is not better feeding just as important as better breeding?—Yes, both the questions go side by side, but in places where cattle-breeding is going on there is much more grazing available than in cultivated areas. Breeding proper here does not go on in villages, but in uncultivated places belonging to Government or Indian States.

28492. And then the cattle are brought from these districts to the cultivating districts?—Yes.

28493. It is no use having plenty of fodder at the place where the cattle are bred if the cattle are not to be provided with fodder at the places where they are going to work, is it?—There is no good in introducing new breeding farms in places where there is no fodder at present.

28494. But the important thing is that the cattle belonging to the cultivator whether used for purposes of giving milk or for providing draught power, should be better fed: that is the aim, is it not?—Yes, the cultivator does try to keep his cattle well fed.

28495. Are you satisfied with the condition of the cattle as a whole in this Province?—The work cattle are maintained by them in fairly good condition. There are some extra cattle which go on increasing and these are not looked after very well.

28496. On page 107 you say that you think the dates of payment of land revenue and water rate should be so changed that the cultivator will be able to store his produce and to market it at two or three periods in the year instead of the whole of it at one time. You do not suggest that the land revenue collection should be taken bit by bit at three periods of the year. You suggest that the time of the collection should be postponed?—Yes, as for instance in the rice tracts the major part of the land revenue is collected in the month of February. The crop is harvested in November, is ready for the market in December and January, and immediately after that they have to take it to the market for sale. At that time there is a surplus supply in the markets. But if the date of payment of land revenue be changed to May or June, the cultivator will get more time for disposing of his produce, from December up to the month of May.

28497. Do you think there is any danger that an arrangement of that sort might lead the cultivator to spend the money which he gets for his crop, and then perhaps to borrow in order to pay the land revenue?—I think he is now very careful to at least keep by him the amount of land revenue.

28498. He is now, because the demand comes so very soon after the sale of his produce. Do you think he would be as ready to keep the money to pay

land revenue by him if he sold, let us say, in May and had not to pay his land revenue dues until December?—He will be very careful in that respect; he will see that he does not miss paying the land revenue; the tenancy right prevails there and he will not let the land go away from him simply for non-payment of land revenue.

28499. What other crops are you yourself growing?—I grow rice on 10 acres, watermelons on 2 acres; in the coming year, I intend to grow potatoes also on 2 acres.

28500. Will that be for the first time?—That will be for the first time.

28501. Where is your market for watermelons?—I am near a railway station, and they can be exported to Nagpur and Jubbulpore.

28502. Do you find you have a good demand for watermelons?—Yes; I am quite sure that the supply of watermelons, at least in Jubbulpore, comes from Hoshangabad district.

28503. Where do you propose to get your seed potatoes from?—From Naini Tal in the United Provinces.

28504. Do they grow seed potatoes there?—No, but they keep a supply of seed on the Government farms and we get supplies from there.

28505. So that, the Government farms in this Province have no seed potatoes?—No; they have to renew their seed supply every year. Recently the Bilaspur farm has done so, and the Chhindwara farm is also doing it.

28506. Where do those seed come from?—I have no knowledge about it.

28507. Are you following a regular rotation on your land?—No rotation is possible for rice, except that heavier types of soils can be sown with pulses after the rice crop, as a catch crop. With sugarcane, I have not so far done any rotation. I keep the land fallow; in the rains I cultivate it and in the following year I plant it with sugarcane.

28508. You can manage a catch crop on a rice area without disturbing the land for the next year's rice crop?—Yes; that is the system in vogue here.

28509. *The Raja of Parlakimedi:* In your part of the district, what are the main crops grown?—Rice is the main crop; there is a little wheat; rice is followed by pulse crops; they are the catch crops supplying the required pulses to the cultivator.

28510. Is all your land a paddy growing area, or is it dry?—I have 10 acres of paddy on my farm.

28511. What varieties of paddy do you grow and where do you get them from?—The *bhondu* and *luchai* varieties. They are the selections made by the local Agricultural Department.

28512. Have you at any time made a study of the paddy crops grown at Coimbatore?—We have not imported paddy seed from Coimbatore.

28513. What green manure crop do you chiefly grow in your paddy land?—I am not manuring my paddy at all at present.

28514. No manuring at all?—No.

28515. Not even farmyard manure?—The supply of farmyard manure is very meagre and is not sufficient for my requirements. *Sann* hemp is recommended by the Agricultural Department; on their farms they grow it in the hot season, with irrigation from Government tanks; but the conditions of water-supply are not satisfactory and so I have not been able to introduce this green manure crop for paddy on my farm.

28516. It need not be grown as an irrigated crop at all, if it is sown early enough?—We have tried it sufficiently in the rice fields; it does not grow, because the rainfall is so heavy that it makes no progress; there is hardly one month's time from the time of sowing to the time of transplanting the seedlings, and it makes no progress in that time.

28517. In your land, what is the yield of paddy per acre?—I get 2,000 lbs., but the cultivators in my district do not get more than 1,200 lbs. on an average, although in some places they do get 2,000 lbs. also; the average is not more than 1,200 lbs.

28518. *Sir Ganga Ram:* Is 2,000 lbs. very high?—In the opinion of the ordinary cultivators, it is high, but I am not satisfied with it; I am aiming at taking it up to 4,000 lbs. because in favourable situations in this Province we do get 4,000 lbs.

28519. *The Raja of Parlakimedi:* Without manuring, how did you effect this increase of yield, as compared with the yield of the ordinary ryot on his holding? Have you a better soil?—I have a better soil, and I have some advantage of silting in my fields; I am on the bank of a river; adjoining my farm there is the general pasture to which the cattle of all the cultivators come, and I receive the drainage of that portion into my fields.

28520. It will be interesting information to you that in my part of the country, we get not less than twice to three times of what you are getting from your fields here?—Is your outturn 6,000 lbs. an acre?

28521. It is 4,000 lbs. to 5,000 lbs. an acre?—That is what I am aiming at; I am not satisfied with 2,000 lbs.

28522. Have you tried to grow rice with green manure?—In my answers I have suggested that green manure will not be a feasible proposition for general adoption here. I have suggested that the cultivation of *karanja* trees should be started; I have information that in the Madras Presidency they manure their rice with *karanja* leaves.

28523. Not everywhere, but only in certain parts. In the whole of the Northern Circars, *dhaincha* is grown as a green manure crop for paddy lands. It is a fast growing plant, and easily mixes with the soil?—We tried *dhaincha* along with *sann* hemp in the beginning when the Agricultural Department began its work in the division, but that crop also did not do well here; my idea is that *dhaincha* will grow in rich fields only.

28524. But when you silt your fields, it is rich enough to grow this sort of green manure crop?—It is too wet; mostly, it is full of flood water.

28525. To what extent do you make use of buffaloes for your cultivation in paddy land?—I do not go in for buffaloes; I keep bullocks only.

28526. Not even for puddling and levelling?—We have fair-sized bullocks and they do the puddling and levelling all right.

28527. Is the seed broadcast or transplanted?—The whole of it is transplanted.

28528. How do you do it. Is it by single seedlings or in bunches?—On my rich fields I have only single seedlings, but in poorer fields I have to do it in twos and threes.

28529. How many measures of seed do you use per acre?—On an average I am using 50 lbs. If I did it in single seedlings 30 lbs. would do.

28530. Even less ought to do?—Yes. I was on the Raipur farm, and my own experience is that in one year only 10 lbs. of seed were used for one acre.

28531. Do you manure your seed beds?—They are heavily manured.

28532. What manure do you use?—Cattle-dung.

28533. Do you pen sheep also?—That system is not prevalent in my part of the Province, but in the Chanda district it is largely practised.

28534. What is the type of cattle you would require in your parts?—The Gaolao breed is much in demand.

28535. Is it a dual purpose animal, or is it a draught animal?—I should say it is a dual purpose animal, because the cows give 3 to 4 seers of milk whereas the local cows give only ½ to 1 seer of milk, but they are not so good milkers as some of the cross breds on the Government farms.

28536. Are you yourself taking any interest in the improvement of the indigenous breeds of cattle?—No; I have not many cows; I only keep one or two milch cows sufficient for my milk requirements.

28537. Do you not think that you will be doing good service if you get a good bull and try to improve the breeds in your neighbourhood?—I am not doing philanthropic work at present.

28538. Is there anybody who is doing that sort of work?—No.

28539. Is any cane grown in your parts?—There used to be the *kathai* and *mungi* varieties, but since the introduction of the *khari* variety by the Agricultural

Department, they have become extinct in places visited by the Agricultural Department; they are now seen in patches where the Agricultural Department has not been able to reach.

28540. Are they grown as unirrigated or irrigated crops?—Irrigated, from wells mostly.

28541. Why has the cultivation of sugarcane been given up?—For want of manures. Formerly they did not know the manures and were not applying any, but now they have taken to the use of manures and the cultivation is now increasing.

28542. *Prof. Gangulee:* What manures?—Oil-cake, nitrate of soda and ammonium sulphate.

28543. Have those manures been suggested by the Department of Agriculture?—Yes.

28544. *The Raja of Parlakimedi:* What is the net profit per acre on a cane-growing area?—The outturn of the cultivator is very low because he does not fully manure his crop, but I am getting a net profit of Rs. 200 already on my farm, and I am of opinion that the net profit can be still further increased.

28545. *Sir Ganga Ram:* You make a profit of Rs. 200 an acre?—Yes, but I am hopeful that this net profit can be increased to even Rs. 300 per acre; by using a power mill the cost of crushing will not be so high.

28546. Why do you not get a power mill and try to increase your profits?—If I had a power mill I would increase my cane area to 20 acres, but I am handicapped by shortage of funds.

28547. Why do you not try the *motes* drawn by cattle for irrigation?—They have been tried and condemned.

28548. Do you try roller mills also; they are quite efficacious in the extraction of juice?—I am using them, and also the bullock-power cane mills; but then my work is very greatly restricted; I cannot increase the cultivation. With great difficulty now I am dealing with 10 acres of sugarcane. I had another variety of cane and I experienced great difficulty in crushing; my bullocks were overstrained and have suffered on that account.

28549. Buffaloes will be more useful for that work. In my part of the country, buffaloes are used for these mills and they can stand the strain?—Your country must be cooler than ours.

28550. There is more vegetation there?—The buffaloes are not able to work in the sun.

28551. You must create a shade for them and you must have a few sets working by turns?—Some people do use buffaloes; but the difficulty is that they should work by night whereas with bullocks we can carry on the work by day.

28552. Do you have cattle diseases breaking out in epidemic form frequently?—Not frequently. There are cases where cattle die on account of some disease, say five or six in a village in a year.

28553. Do the ryots in these parts welcome the present method of eradicating those diseases by inoculation?—I should say they do not know it much.

28554. Is anything being done in that line?—The Veterinary Department tries to do it and, wherever the people agree, they inoculate; but the difficulty experienced is that timely action is not taken. A report goes to the Veterinary Assistant Surgeon; on receiving that report he comes to the spot; then he takes the blood and sends it for confirmation of the disease and after receiving the reply from the superior officer he goes to carry out inoculation, and by that time probably the mischief has already been done or the disease itself may have subsided.

28555. It is entirely due to want of staff, is it?—Yes.

28556. Would you like to see the staff increased in that department?—Yes, of course.

28557. As regards irrigation, what are the rates usually adopted?—Only rice is irrigated at present, leaving out the question of sugarcane which is not general. The rate commenced from 8 As. per acre and this year it is Rs. 3-4-0. Under the present agreement, within a period of ten years from the commencement the rate should go to Rs. 3-12-0 by an increase of 4 As. every year.

28558. Does it depend upon the standard of the crops or what?—They have a regular increase. They want to bring it to Rs. 3-12-0 by the end of ten years.

28559. Is it adopted in all cases of irrigation, river, channel, tank or any other irrigation?—In all Government works the same rates are adopted.

28560. *Sir James MacKenna:* Have you any experience of Pusa wheat?—I have not grown it on my own farm; but on Government farms I have grown Pusa 100.

28561. What is your experience of that?—It gives a better yield than the local wheat.

28562. Much better?—The outturn of wheat is very low here. I should say it is not more than 500 lbs. per acre, which is considered to be a very good crop. An increase of even 50 lbs. per acre with some other variety is welcome and that was found to be the case with Pusa wheat. But then there is scope for improving the local wheat also. In the north of the Province, to which I belong, the local wheat has been improved, but no such attempt has been made in the case of Chhattisgarh wheat.

28563. But so far as Chhattisgarh is concerned, the introduction of Pusa wheat has been a distinct advantage to it?—I do not know how much is distributed every year and how much extension is taking place; but I can give this opinion that it is decidedly a better wheat than the two local varieties of wheat.

28564. Have you been a member of the Local Legislative Council?—My position is too humble for that.

28565. Do you follow the proceedings of the Council?—I do.

28566. What do you think the attitude has been towards agriculture? Friendly?—Not one of sympathy. They have rather criticised the work of the department and progress is therefore handicapped.

28567. Has the budget been seriously cut by the Council?—Yes; in the last session it was cut, I think, to a great extent.

28568. *Prof. Gangulee:* What do you think is the reason for the Legislative Council not taking much interest in agricultural matters?—Because the members are not agriculturists.

28569. But surely they have an interest in agriculture, the premier industry of the country?—I do not think they have.

28570. You say you cultivate about 40 acres of land?—35 acres, of which 10 acres are under rice and 10 under sugarcane.

28571. Do you cultivate yourself or by tenants?—By my servants.

28572. You employ labour?—Yes.

28573. You pay them daily wages?—Monthly wages.

28574. Could you give us an idea of the cost of cultivation per acre of paddy?—Yes, roughly Rs. 20 per acre.

28575. And the cost of cultivation per acre of sugarcane?—Rs. 200 per acre.

28576. And you say your net profit out of sugarcane is Rs. 200 per acre?—Yes.

28577. What would be the net profit from paddy?—My crop gives me Rs. 40; but the ordinary cultivator gets Rs. 20.

28578. Because you use better seeds?—Of course I use better seed, no doubt; but then my outturn is higher.

28579. Due to better manure, I suppose?—As I have just said, I have a very favourable situation which is not general.

28580. Where do you get your seed supply from?—I am very near a Government demonstration farm.

28581. You get your seed from the Government farm?—Yes.

28582. What is the cost of the seed that you get?—Their rate is 30 lbs. per rupee.

28583. The rate is increasing lately, is it?—It had increased very much: once it had gone up to 20 lbs. per rupee and now it has come down to 30 lbs. per rupee.

28584. Do you distribute seeds to your neighbouring farmers?—No.

28585. You do not buy in quantity from the Government farm and distribute seeds to the tenants in the neighbourhood?—No; I purchase seed sufficient for my own requirements.

28586. Now with your experience as a farmer, can you tell us what significant changes you observe in the method of cultivation in your district?—The recommendations made by the Agricultural Department at present are for changing the seed, for using the iron plough instead of the wooden one, and changing the method of cultivation, and so on.

28587. What I want to get from you is this: to what extent are these recommendations of the Department of Agriculture being adopted by the cultivators in your district?—As far as the Agricultural Department is able to work, it is successful; but this is a big country and the staff of the department is very small; if private individuals would also help the progress could be increased very much.

28588. I understand that; but what I wanted to know is, do you find any significant changes in the methods of cultivation in your district?—I do find people aspiring after good seed; the improved iron plough is being easily sold now.

28589. What is the price of an iron plough?—In the last season it was sold for Rs. 8-4-0.

28590. Do you find that the farmers in your neighbourhood are utilising better implement and better seed?—Yes; but then I may also tell you that these varieties of seed are not fit for general adoption. If you go to a village where the improvements have been introduced you will notice that they are not adopted wholesale.

28591. For the introduction of better ploughs and better seed do you give the entire credit to the Department of Agriculture or to any non-official help?—The department was helped to some extent by non-officials.

28592. Are you a member of any non-official association?—I am a member of the Tahsil Agricultural Association.

28593. How many members come from your district?—There are about sixty or seventy members, but very few attend the meetings.

28594. On page 101 you make a very interesting suggestion that the malguzars or leading and influential cultivators in the village should be paid for the trouble they take. What have you actually in mind? How are they to be paid?—They should be paid the travelling allowance and the daily allowance. As a matter of fact, the real cultivator is very busy and we have to remunerate him for the loss which he will suffer by his absence from the farm.

28595. I am not talking about the ordinary cultivator; you mention here about the malguzar?—Yes; the malguzar who is in touch with agriculture is very busy and the malguzar who is not in touch lives in a town and does not count.

28596. These malguzars are also members of these associations, the District Association, the Taluk Association and the Circle Association?—We have only the Tahsil Association.

28597. I think some of these malguzars are members of that association and you want the Department of Agriculture to pay for the trouble that these members take; is that right?—A new selection will have to be made to get the right type of men.

28598. Do you think it is a sign of public spirit that you want payment for your trouble?—At present the difficulty is there is no proper attendance in the meetings and this is one of the ways in which you might try to ensure attendance, though I am not quite sure that you would succeed even then.

28599. With regard to the new varieties that you grow here, do you get a premium price?—Yes, we do.

28600. You get a premium price?—Yes, a slight premium, say 14 per cent a *khandi* of local paddy is sold for Rs. 7 while a *khandi* of improved rice will be sold for Re. 1 more.

28601. How does this improved paddy compare with local paddies in yield?—It is reported by the cultivators that by taking to this improved paddy they have slightly increased their outturns.

28602. Have you any idea to what extent it has increased?—Well, that is such a difficult question to answer; you know the outturn of paddy varies from 500 lbs. to 5,000 lbs., so that you cannot say how much the increase is due to the improved variety, but the cultivator who has been growing the local varieties for such a long time appreciates these varieties and says that he is now getting a better outturn.

28603. He is getting a better outturn from these new paddies?—Yes.

28604. You have no idea of the increase of yield?—My conclusion is that the impoved variety is at least 10 per cent better and it would probably not be an exaggeration if I said 15 per cent.

28605. Irrespective of better cultivation and other factors?—With the same cultivation as is given to the local paddies.

28606. Can you tell us why there was no success in introducing transplantation of paddy in your district?—In my district they have transplanted from time immemorial.

28607. In the other district?—I was serving there and I was carrying on the work; the difficulties in the way were want of irrigation arrangements, the scattered fields and the cattle were too small for the operation of transplantation.

28608. Those are the reasons to which you ascribe the fact that transplantation of paddy has not been a success in this district?—I am also inclined to think that the rainfall of this tract is short of what is required for transplantation; for transplantation more rain is needed.

28609. Do you get any water-supply from the Government's irrigation works?—Yes, I get water for the irrigation of my rice as well as for part of my sugarcane area.

28610. Can you tell the Commission the system of agreement you have to enter into with the Department of Irrigation?—When the works were ready and the Irrigation Department was able to supply water to the cultivators, a system of agreement for irrigation was introduced for a term of ten years; in the beginning the water rate for us was calculated and is gradually being increased at the rate of 4 As. per annum and has got to go up to Rs. 3-12-0 per acre.

28611. What is the system; does the whole village have to enter into an agreement, or the individual farmer?—In the commanded areas if 80 per cent of cultivators agree to take water, the remaining 20 per cent will also be considered to have agreed.

28612. For water lifting you have introduced the Persian wheel from the Punjab?—Yes.

28613. Have any other malguzar visited your farm and watched the operation of this Persian wheel?—Yes, four or five malguzars came who had heard that I had got an improved lift; they knew me and wanted to see if I could suggest something to them; they came, saw the lift, purchased it and are using it.

28614. So that they have taken to this new method of water lifting?—Yes.

28615. On page 103 you say it is highly desirable that the size of holding for rice should not be less than 4 acres. Why do you put it at 4 acres; have you worked it out that 4 acres is the minimum economical holding for rice?—At the present time, with a pair of bullocks, a cultivator with his family, assisted at times by some extra labour, does cultivate some 6 acres of rice; but then he is over-worked. 5 acres is liked very much, but as we cannot prevent this fragmentation, I have taken this figure of 4 acres so that a little more scope may be allowed to other shareholders.

28616. You want to bring about this consolidation by arbitration. How?—By panchayats. The parties should first try to settle it amongst themselves; but if they cannot, it is necessary that legislation should be introduced to provide for arbitration.

28617. Have you had experience of arbitration in this matter?—No, it is a new move.

28618. Nothing has been done?—No.

28619. You have no data to show us that some success has been achieved through arbitration?—No, it has never been attempted.

28620. Is it your view that indebtedness in your district is increasing?—It is my opinion that there ought to be no indebtedness if a fair rate of interest

were charged. The cultivator pays and pays and yet he is not free; he pays much more than he ought.

28621. Are you a member of any co-operative society?—No.

28622. You are not in touch with the co-operative movement?—No, I am not.

28623. Do you lend money yourself?—No, I am not a moneylender.

28624. On page 103 you make reference to the mortgage question and you say that the lands have passed from the hands of the cultivators into those of moneylenders. Is it your experience that that tendency is still marked in your district?—Where cultivators have a right of transfer or sale the lands have passed from them, but generally there is the tenancy system and the cultivator has not the right to sell.

28625. You have also expressed your views with regard to education; is there any school in your own village?—No, not in that village, but at a distance of a mile and a half there is the primary school.

28626. Have you yourself made an attempt to introduce better schools in the district?—To introduce better schools?

28627. Well, any school for that matter?—I do not think that is a matter for the individual.

28628. You think there is a general demand for education?—Yes.

28629. A demand amongst whom?—The cultivators, the labourers, everybody.

28630. Do the malguzars and landlords take any interest in educational matters?—They educate their children at any cost; they even send their children to schools at long distances and get them educated.

28631. *Mr. Calvert:* In your note you say that the farm of the ordinary farmer does not offer adequate prospects for one trained at the Agricultural College. Is it your opinion then that the curriculum at the Agricultural College is not suited to the type of cultivation here?—It is costly and a small farmer cannot undertake it. The men turned out from the College will be quite suitable for big farms. By a small farm I mean a farm managed by a cultivator with the help of his family. As there is a shortage of labour, only the small farmer is seen to prosper. Employers suffer a loss.

28632. We are told that the average holding is between 5 and 10 acres?—Yes.

28633. Is there no opening for these cultivators to get training in the cultivation of their 5 or 10 acres?—There are some crops, as for instance, sugarcane.

28634. Where can they be trained to cultivate 5 or 10 acres?—In general cropping we might suggest to him to change the seed or the implement; beyond that we have not much to tell him. There are some crops from which a substantial profit can be made, as for example, sugarcane, which I am cultivating, but everybody cannot be expected to cultivate sugarcane; if they did, there would be over-production of the crop and it would be sold at a loss.

28635. You suggest plots in which vegetables should be grown?—Yes.

28636. Is there any caste prejudice against the growing of vegetables?—No.

28637. You say that the leading cultivators do not help in demonstration?—Yes, they do not take enough interest.

28638. But we gather from the printed note that the Agricultural Department has directed its demonstration towards the bigger cultivators?—Yes.

28639. Would they have achieved better results if they had tried with the smaller men?—The men that the Agricultural Department has chosen are doing the work all right, but if they would help to the extent to which they could much progress would be achieved.

28640. The point is that the bigger cultivators are not helping?—Yes, there ought to be help from the malguzar of the village, or, if he is absent, the leading cultivator, the influential cultivator in the village.

28641. He ought to, but you say he does not help?—Yes, he does not help.

28642. Do you think the demonstration should be directed towards the smaller cultivators?—Through the medium of these bigger men who carry influence in the village.

28643. What kind of influence do they carry? Is their influence in favour of better cultivation?—The rich men are generally respected, and agriculturally they also carry some respect as being better men, supplied with better equipment for carrying on their work in a better manner than the poorer cultivators can do.

28644. Actually are they using their influence on the side of improved agriculture?—They are not doing anything in that direction at all.

28645. You used the expression "leading cultivators"?—Yes.

28646. In regard to what are they leading?—They are the men I have just described who have the proper equipment for carrying on their farms in a better way than the poorer cultivators; they command respect in the village and if they took an interest in improved agriculture their example would be quickly followed by other men.

28647. Yes, but you say they do not take an interest in agriculture; I want the facts?—In their own local matters they do.

28648. Do the malguzars lead in improved agriculture?—Yes, they do in local matters; if they lead in improved methods, the improved methods will spread.

28649. But do they lead in adopting improved methods?—I should say no, and that is why I say they should be made to do so.

28650. In another connection, you say a bank should be opened and loans given on the recommendation of the Agricultural Department. Would you like to give your opinion on the kind of bank you advocate?—The same sort of bank as the Co-operative Central Bank.

28651. Later on you say that you think limitations should be introduced as to the number of extra cattle the cultivator could keep? Have you any proposal as to how you would limit that number?—Yes; in cultivated areas where there is no grazing available the number of animals which the cultivator keeps, over and above his requirements, for example, an extra milch cow or buffalo, this should be limited.

28652. But how would you limit it?—A man owning say 4 or 5 acres of land should have so many cows.

28653. But how could you limit it? What would the man do with the extra cattle? Would he dispose of them?—He could sell them.

28654. By law?—He could be allowed to keep the number of animals which he should keep and he could dispose of the extra cattle as he liked.

28655. *Sir Henry Lawrence:* Would he sell them to the butcher?—To men who have not got cattle and who wish to purchase them. There is a big cattle market and cattle business is going on. If a cultivator is in need of money he sells off his bullocks and where do these animals go but to those men who have not got cattle.

28656. *Dr. Hyder:* Is it a good or a bad thing that they should not have cattle?—Well, there are areas in which there is a shortage of cattle, and there are some areas in which there is a surplus.

28657. *Sir Henry Lawrence:* Do you want to have the numbers brought down?—Yes, I want them limited.

28658. And you would not have any man keep more than a certain number of cattle?—Yes. In my village there are two non-agriculturists who have got herds of cattle and they are being grazed on land intended for plough bullocks.

28659. Such a law would not give rise to rioting?—I do not know.

28660. *Mr. Kamat:* You have made certain suggestions in your memorandum which I would like you to expand further. For instance, you suggest that men of ripe experience in the different grades of the Agricultural Department desirous of carrying on private farming should be allowed to retire on proportionate pension and that they should receive from Government a subsidy or loan on easy terms? Do you think there are many people who would be willing to retire on proportionate pension in the Agricultural Department?—I am not in touch with all the staff at present, but I can confidently say that at least three men in responsible positions would like to retire.

28661. Supposing in a Province three men in the Agricultural Department retire and do private farming, will it help that Province much in your opinion?—No. Out of, say, ten officers with whom I am in touch if three men retire that is not a bad proportion.

28662. And what guarantee have Government before they give a subsidy or a loan that these people would be able to repay that loan if their private farming failed?—You are spending so much money on the development and expansion of the Agricultural Department.

28663. So this money should be written off?—No, you are spending so much money on the expansion of the department and in case of failure the land will be there. The money would be invested in, say, implements, wire-fencing, bullocks, and the man's house and property would be there as a guarantee.

28664. That should be attached by Government?—Yes.

28665. Another suggestion which you have made is this. You have been emphasising that travelling allowances to members of your association should be paid and your suggestion is that a small cess of about half an anna per rupee on the land revenue should be levied? Could you give me an idea how much this half an anna cess in the land revenue would bring in the Central Provinces?—If I knew the total collection of land revenue I could work it out.

28666. In that case I could work it out myself also. What is the total land revenue of your Province?—I do not know.

28667. You want all of the cesses to be devoted to the payment of travelling allowances, not towards any agricultural reform?—I did make a rough calculation for my tahsil and I came to the conclusion that a cess of half an anna would meet that expense; it was a rough estimate only.

28668. Assuming that half an anna were to be levied, would the payment of allowances to members be the best way of spending it for agricultural improvement?—I think so, because agricultural improvements will best spread in the country through the medium of the leading cultivators on the spot, but these men are not taking enough interest and I suggest that we might try this and see whether it would work or not.

28669. One more suggestion which you make is with reference to veterinary treatment. You suggest that in the villages malguzars should be trained to use certain medicines by the veterinary people. Is that a workable proposition?—That is my opinion.

28670. What sort of medicines have you in mind?—Treatment for ordinary diseases, that is treatment for wounds, for diarrhœa, even for rinderpest.

28671. Then you have another suggestion that for purposes of fuel certain trees should be planted by cultivators, that is to say, if they have 6 acres, 1 acre should be devoted to the planting of trees. Do you think a cultivator having 6 acres would give 1 acre out of that to planting out trees, rice and sugarcane being as profitable as you have described them to be?—I have also said that by using the leaves of those trees as manure and by the use of the cattle-dung which will be saved by the introduction of fuel, the outturn will be so increased that the cultivator will get more grain from the remaining area than he is getting at present.

28672. Supposing you yourself have 30 acres, would you devote 3 or 4 acres out of that for planting trees rather than for sugarcane?—That is what I wish. I have already started that work because I am at a long distance from the forest and I am supposed to bring my supply of firewood from the forest. Why should I not have my own supply of fuel at hand on the spot?

28673. How long will these trees take to grow?—They are quick-growing trees. I think that in ten years they will be big enough.

28674. A man has to wait ten years before he can get his fuel from these trees. Till then cow-dung has to be used? After ten years what would be the value of the fuel from one acre? How much would it bring in at the end of ten years?—In one acre by keeping a spacing of 40 feet some 25 trees will be planted; the cultivator will use one or two trees out of this and plant one or two.

28675. *The Chairman:* You would have a rotation?—Yes.

28676. When you say 40 feet spacing, are you thinking of a catch crop between the trees?—When they are small a catch crop can be taken.

28677. Do you really suggest that the type of plantation best suited for providing fuel is that in which trees are planted 40 feet apart?—Considering the size of the *karanja* tree I think so. I am referring to this particular tree.

28678. *Mr. Kamat:* You say in this Province the people do not understand well sinking and that this work had better be undertaken by the Agricultural Department. I do not know how, when wells in this country have been built in India for thousands of years, these people do not understand the principles of masonry? That sounds very extraordinary?—We are a most backward Province.

28679. With reference to the Persian wheel from the Punjab, have you heard that in Gujarat and Bombay Persian wheels of a certain type are very very common? Have you tried them?—I have tried the Punjab Persian wheel which is much better than the Gujarat wheel. I have been to the Poona Show and seen these Persian wheels. Their cost ranges from Rs. 400 to Rs. 600. They are designed for greater depths; the water level seems to be lower in Gujarat and Bombay than in the Punjab.

28680. You are in favour of introducing legislation for the purpose of castrating bulls? Have you tested public opinion to see whether it would be against it?—I do not think that the idea of legislation would be repugnant to them.

28681. Have you had any idea, if castration were to be carried on a very large scale, how much staff would be necessary?—I think the people should be trained in using that implement adopted in this new method of castration. The Veterinary Assistant Surgeon or Deputy Superintendent should not be allowed to carry on that work alone.

28682. The ordinary people you think should be able to use it?—Yes.

28683. *Sir S. M. Chitnavis:* Is your iron plough suitable for *biasi*?—No. We can only take it up in transplanted areas.

28684. And this has been taken up in Chhattisgarh?—No.

28685. *Sir Henry Lawrence:* I think you said that malguzars are prepared to spend any sum of money in the education of their children?—No, whatever they can afford to spend. Everybody aspires to have his children educated according to his means.

28686. Is this an English education that these malguzars give to their children or a vernacular education?—In the beginning it is vernacular, but he cannot make an estimate in the beginning as to how far he can let his son go in his education. He begins with vernacular, then he sends him to the middle English schools and the high schools and ultimately, if he can afford it, to college.

28687. *Sir Ganga Ram:* Does he not then aim at becoming a lawyer?—He does.

28688. *Sir Henry Lawrence:* What do you regard is a reasonable sum to spend for the education of a boy from the beginning until he takes his degree?—There must be some education in English and he must read up to the Matriculation, but I am not in a position to answer that question.

28689. *Sir Ganga Ram:* What is the market value of land?—It is sold in my part at Rs. 100 per acre on tenancy right.

28690. It is tenancy land?—Yes.

28691. What do you mean by tenancy land? Is it not proprietary land?—No.

28692. You buy the tenancy rights for Rs. 100 an acre?—Yes.

28693. Whom does the land belong to?—In some cases to the malguzar.

28694. Did you buy your own land?—Yes, a part of it from the malguzar direct and a part of it from the cultivators.

28695. And your profit, after paying all expenses, is Rs. 200 an acre?—Yes, for sugarcane.

28696. You said that about one-third of your land is cultivated with sugarcane?—Yes; and Rs. 200 an acre is the guaranteed net profit, if improved methods of cultivation are introduced.

28697. After paying all expenses?—Yes.

28698. It is a very good investment, What pension do you get now?—Rs. 42-14-0.

28699. What was the highest pay you were drawing?—Rs. 140.

28700. Why did you not think of taking up agriculture in the earlier days ?—Because I did not come to know about it.

28701. As an Agricultural Assistant, did you not know it ?—As soon as I knew about it, I did not want to serve.

28702. In what districts have you served ?—In Chhattisgarh and for some time at Jubbulpore.

28703. Have you experience of all the districts ?—I know the Chhattisgarh Division, the Northern Circle, and Bhandara and Balaghat districts.

28704. Where is your land ?—In the Balaghat district.

28705. How can people afford to buy food without money ? What is the crop from which you derive a net profit ? Is it sugarcane ?—Yes. The supply of *gur* is short of the demand here, and it has to be imported from the Bombay Presidency and Madras and the United Provinces.

28706. And cotton ?—The Balaghat district is too rainy for cotton, but I had in mind to try the variety of cotton which is grown in Madras by lift irrigation.

28707. You say that food is short of the demand ?—I said in respect of *gur* and sugar.

28708. Is it *gur* that is short of the demand, or refined sugar ?—There is no supply of sugar.

28709. You import white sugar ?—White sugar and *gur*, both ; we want white sugar as well as *gur*.

28710. You import *gur* ?—Yes, in large quantities.

28711. From where do you import it ?—From the United Provinces, the Bombay Presidency and Madras.

28712. You cannot make enough *gur* for your requirements ?—No ; that is why the profits are higher.

28713. Do you grow wheat for your requirements ?—My land is not suited for wheat.

28714. Do the people import other food also ?—The cultivators do not import ; they grow their own rice ; rice is the staple food ; they also grow pulses.

28715. They eat something with the rice ?—Yes, they eat pulses and they grow their own pulses.

28716. Do they grow enough of pulses ?—Yes.

28717. Are there any *pucca* wells in this Province ?—The wells for drinking water are *pucca* ; irrigation wells are not *pucca*.

28718. They are nowhere *pucca* ?—No.

28719. They do not know how to sink a *pucca* well ?—No.

28720. Do you not ask the Assistants of the Agricultural Department to import well-sinkers ?—I am afraid the Agricultural Department will not be able to help me in that direction.

28721. Why ?—Because they have not got a well-sinker.

28722. They can import one from the Punjab ?—I discussed the question with the Agricultural Engineer when he paid a visit to my farm. I suggested it to him but he said he was short of funds, and that he could not take up any new work owing to shortage of funds.

28723. There is nowhere a *pucca* well for irrigation ?—No.

28724. Has the Persian wheel that you imported got iron buckets ?—Yes, all its parts are iron ; only the frame is wooden though iron framing can also be imported but it would add to the cost.

28725. The people are quite able to put it in repair, if anything goes wrong with it ?—It is only two years since it was installed, it is working all right ; no difficulty has arisen so far.

28726. *Sir Thomas Middleton* : You have been serving in most parts of the Province ?—I have experience of this Division, Chhattisgarh ; I have also experience of the Balaghat district, and I was in the north of the Province in the Jubbulpore district.

28727. You got your early instruction in agriculture in the Nagpur school?—Yes.

28728. When you had seen the advantage of agriculture in the Province, you made up your mind to go in for farming after you retired?—Yes.

28729. You selected a piece of good land?—Yes.

28730. How much land were you able to get?—35 acres.

28731. You think that there are a number of others in the department who, if they were allowed to take proportionate pension, would use their opportunities of seeing what can be done and acquire land, as you have done, for farming; that is your opinion?—Yes.

28732. How many, do you think, would avail themselves of an offer of that sort if it were made?—I am in touch with ten officers out of whom at least three would agree to retire.

28733. We have another proposal of the same sort. A prominent witness in another Presidency made the suggestion that after agricultural officers had been employed for ten years, they should be dismissed and made to go in for farming. What do you think of a suggestion of that sort?—The activities of those trained men would be hampered for want of money; it would not help them.

28734. You have told us what profits you make in sugarcane. Does the rest of the land pay any profit? You have 10 acres of sugarcane on which you make a profit?—Yes, and 10 acres of rice; 10 acres have to be left fallow for the succeeding crop. Sugarcane cannot be grown continuously.

28735. Is there any net profit from the rice land?—I derive very little profit from it because I am an employer of labour and I have to pay very high rates for labour; in my district the manganese mines are working, and on account of that the wages of labour are high.

28736. How many pairs of bullocks do you require for the 35 acres?—In the busy season, when cane crushing goes on, I keep four pairs, but in the rainy season, I keep two pairs.

28737. You can hire them in the busy season?—I purchase them, as I am near a cattle market; I sell them at a reduced rate when I do not want them.

28738. Do you lose much in selling?—I do not mind that, because the cost of keeping them is higher than the loss I sustain by selling them.

28739. Cane crushing work is very heavy work and the bullocks obviously deteriorate a good deal?—I actually suffer on this account; my bullocks deteriorate on account of the very hard work they have to do.

28740. You have taken that into account in estimating your profits from sugarcane?—That was not the case with *khari* cane.

28741. In what part of the Province do you find the best cattle?—In Berar there are good cattle, but I do not think they are bred there.

28742. Where are they bred?—In some jungly tract which I do not know.

28743. And the worst cattle you find here?—Yes, in this Division.

28744. From your answer, I take it that you have never been in these jungly tracts where they are breeding cattle?—I have been through those tracts in my official capacity.

28745. What class of men breed the cattle? What tribes?—They are professional cattle-breeders.

28746. What do you call them in the Central Provinces? Are they called *rabaris*?—They are called *gowalas*; they are also men who come from Central India and they are called *banjaras* or *naiks*.

28747. Are they usually very skilled and very careful breeders?—They do not carry on that work scientifically.

28748. Is that because fodder is getting scarce?—They have no knowledge as to how that work can be improved.

28749. You mentioned that you use sulphate of ammonia for your sugarcane?—Yes.

28750. And you think that some steps should be taken to prevent adulteration of manure; have you ever found any adulteration in a manure like sulphate of ammonia?—No, I get my supplies from the Government farm, where it is tested. I do not get it direct from the dealers, and I have suggested in my written answers that this procedure should be followed.

28751. How do the cultivators who have not been in touch with the Government farms get sulphate of ammonia, if they use it?—They do not use it for other crops than sugarcane.

28752. Where do the sugarcane cultivators get their supply of sulphate of ammonia from?—The only source for them is the farm depôt; if they use it they must go to the farm and get it.

28753. *Sir Ganga Ram:* What price do you pay for sulphate of ammonia?—Rs. 220 per ton.

28754. And what do you pay for nitrate of soda?—That also is about the same price; I am not quite sure of it.

28755. How many hundredweights do you put on sugarcane?—It is on the basis of nitrogen content; I apply 150 lbs. of nitrogen to my cane crop altogether, out of which 50 lbs. is in the shape of ammonium sulphate and 100 lbs. in the shape of oil-cake; it is on the basis of nitrogen content.

28756. You also use nitrate of soda?—I use ammonium sulphate because in it the unit of nitrogen is available at a cheaper rate than in nitrate of soda.

28757. *Sir Thomas Middleton*: Do you grow any green manure crops on your own land?—I wish I could grow them. When I was at the Poona Show last October, I had information that in Madras they green-manure their fields with leaves of trees. I knew it ten years ago, but I did not know positively which leaves were suitable or were used by them. I met a big landlord of Madras in the Show, and he told me that *karanja* was mostly used by them.

28758. You have not grown it yet?—No.

28759. Do you know whether it wants much moisture in the soil?—I had planted *karanja* trees on the Government farm for shade, and I noticed they were quick growing trees.

28760. Do you use *karanja* cake?—It is used for sugarcane.

28761. *Sir Ganga Ram*: Do crops grow under its shade?—When the tree is full grown it is not possible to grow any crops under its shade, but in the beginning it is possible.

28762. *Sir Thomas Middleton*: Does the *karanja* tree want deep soil with plenty of water or will it grow on dry land?—It is growing on the roadsides here everywhere.

28763. *Mr. Wills*: You said that you recommended the postponement of the revenue payments?—Yes.

28764. Is that with a view to benefit the marketing of the crop?—Yes, so that they can have more time to dispose of the crop.

28765. Is it primarily intended for the benefit of the proprietor of the village or the tenants?—The tenants.

28766. Do you not think it is possible that if the date of payment is postponed, the tenant may find difficulty in finding the money to pay?—Now the tenant is so very careful that he will not fail to pay.

28767. On page 103 of your note you suggest that it is not very advisable that the cultivator should handle cash. "Granting of *taccavi* loans on the recommendation of the Agricultural Department for seed, manure and implements is working better as the cultivator does not handle cash." Does not that suggest that you rather distrust the capacity of the cultivator for holding up cash against his requirements?—I do; he is so much pressed at times that he may spend that money in other directions.

28768. You do not think that the postponement of *kist* will help?—He knows that if he does so he will be dispossessed of the land; the value of the land is rising; the land revenue is Rs. 2 or Rs. 3 per acre and in three years it may go up to Rs. 10, and for the sake of Rs. 10 he will not let the land go.

28769. Is it a fact that certain unscrupulous malguzars encourage arrears of rents as much as possible with a view to getting hold of the land?—Yes; but the tenants are very careful now.

28770. But do the malguzars encourage arrears ?—In my village the malguzar is not a moneylender. He has no money to lend out.

28771. You never had any training in the Revenue Department ?—No.

28772. Do you think it would serve any purpose if selected officers of the Agricultural Department had a certain training in the Revenue Department in the earlier years of their service ?—I think officers of the both departments should interchange. Formerly, the Revenue Inspectors were recruited from the agricultural school; that system worked very well and those officers have been very successful; they have risen even to the post of Extra-Assistant Commissioner.

28773. Let me give a concrete suggestion. Supposing the members of the Agricultural Department were deputed to work as Assistant Settlement Officers for two or three years in the earlier period of their service, do you think that would be a useful experience for them ?—You mean they should work as Assistant Settlement Officers to start with without having experience of lower grades as Revenue Inspectors ?

28774. After they have had a certain amount of experience in the Agricultural Department they could be tried; but assuming that could be done you think it would help them in dealing with agricultural problems afterwards ?—Yes; it would.

28775. *The Chairman*: When did you retire from the service ?—I retired only two years ago, but have been working on my farm for the last four years.

28776. Did you retire before the usual period of service ?—There was some defect in my health and as I also wanted to work on my farm I took leave before retirement.

(This concludes the witness's public evidence.)

Mr. PURUSHOTTAM PRASAD PANDEYA, Malguzar, Balpur, Bilaspur District.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—Research affecting the welfare of the agriculturists and veterinary research—both are of importance but they must be carried on with economy. Indian youths from all parts of India should be selected for this work.

QUESTION 2.—AGRICULTURAL EDUCATION.—To induce the masses to take special interest in cultivation, practical knowledge of producing country vegetables should be imparted. Vegetables are scarce in villages and if they are grown properly, they are sure to benefit the cultivators.

Instruction should be given to the agriculturists on social economy, *i.e.*, they may realise that wasteful expenses on social gathering lead to a great extent to their ruin and indebtedness. They may copy the examples of thrifty agricultural classes like the Aghariya caste in the Bilaspur and Sambalpur districts. This caste is noted for its frugality, sobriety and temperate habits.

QUESTION 5.—FINANCE.—(*a*) There must be such societies and farms which might advance money and seed to the needy cultivators without interest. The big landlords may be induced to help their brethren by giving them loans on moderate or nominal interest.

(*b*) *Taccavi* is good. But the method of realising it is discouraging and appears to be very hard.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) Poverty and want are the main causes of borrowing. Death or marriage in the family, purchase of cattle, continued illness, failure of crops, house building, these compel a man to borrow money. They fail to repay the loan on account of high interest and owing to scanty income.

(*b*) For loans to agriculturists, the rate of interest must be fixed by Government. They might be very low. Yes, measures should be taken to deal with rural insolvency and to apply the Usurious Loans Act. Sometimes villages and holdings are taken by the moneylenders and the original owners' families become paupers. Laws should be made to save the children of such unfortunate malguzars and ryots who borrow money and do not care to repay it. Some agriculturists are addicted to wine, opium, hemp and fall a victim to usurers who lend them money on high interest and deprive them of their landed property, to the ruin of their sons and grandsons. The Government should make laws to see that the sons and families of such foolish creatures may not lose their ancestral property, if they manage to pay the actual loans *minus* all interest. Mortgaged landed properties should never lapse to moneylenders and for this laws should be so made.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) If holdings are in one plot and block, the cultivator can do much to increase his income and produce better quality of corn. But with the partition among brothers the fragmentation continues in spite of individual attempts at consolidation of holdings.

(*b*) The ryot class as a rule are against the consolidation of holdings, while the malguzar class favours it. But it is of great good to both the classes.

(*c*) Yes, legislation to save and safeguard the interest of minors and widows is more necessary. Persons legally incapable, do such things as are ruinous to their family and sons. There must be strong restrictions against moneylenders in their way of cheating and entangling needy cultivators. The civil court may be directed always to side with the poor and indebted peasantry where their holdings and villages are concerned.

QUESTION 8.—IRRIGATION.—In the Bilaspur district, especially in the tracts transferred from the Sambalpur district, tanks are the only source of irrigation. These tanks are very very old water reservoirs and they were dug out not by the State or the old Rajas but by the malguzars and charitably disposed persons for supply of drinking water and for irrigation. In Government villages and in *khalsa* areas, no great trouble

is experienced for getting permission to improve or enlarge old tanks or to make new tanks by ryots and malguzars. The Deputy Commissioner shows enough sympathy and commonsense in sanctioning such applications. But in villages which are under a superior proprietor or talukdar, it is very difficult to obtain his consent and permission. The superior proprietor or talukdar will not give his consent unless his demands are fulfilled. He is himself unable to improve or construct such tanks, but he will not permit others to do so unless he is paid a heavy sum as a private present. He does raise objections to the granting of *sanad* or certificate for improvements effected by the ryot or inferior proprietor or the malguzar. All such restrictions should be removed and the makers of tanks for irrigation should be given every possible encouragement by the Government and the talukdars be instructed to be reasonable and just.

QUESTION 15.—VETERINARY.—The agriculturists are learning to make use of the veterinary dispensaries but they are far removed from the villages. It is beyond the power of villagers to go there or to get assistance just in time. The travelling dispensaries also cannot be of service to the villagers as the stock of medicines they keep is always not enough. With every *Patwari* there ought to be a small stock of medicines to serve in time. The agriculturists might easily get to the *Patwaris* and can bring medicine. *Patwaris* may be taught easy lessons on "cattle diseases and their treatment" and there must be an easy literature to help the lettered people. Medicines are not found in ordinary shops and the stock of medicines in noted centres is necessary. Information reaches the veterinary dispensaries too late and the doctor sometimes visits a village after the disease has subsided after killing numbers of cattle. The doctors consider it as a burden to visit out-of-the-way places and sometimes their treatment of the people is very harsh. The majority of the agriculturists are too poor to spend anything on treatment of cattle without the help of moneylenders or their rich brethren. Instead of appointing a superior Veterinary Officer the strength of doctors and subordinate officers should be increased in every district and they should be sent in large numbers to villages affected with contagious diseases.

QUESTION 16.—ANIMAL HUSBANDRY.—"The cow is the mother of prosperity" is a well known proverb and it contains in it the greatest truth. India is a land of *Gopal* the cow-worshipper's God. It was a mine of milk, curd, pure *ghi* and butter. But now there is a famine of unadulterated milk or *ghi* even for medicine. The result is that Indian people are getting weaker and weaker and early death and disease are the results. Even in villages, the infants do not get milk in ordinary quantity and the milk of their own mothers is inadequate to nurse them properly. The number of cows is decreasing every year. Under the circumstances, breeding farms and dairy farms must be opened for every group of 40 or 50 villages all over India. The capitalists should be induced to finance and support such farms. This is as imperative as the education of the children. The cows may be of pure Indian breeds. Government ought to take a leading part in breeding and dairy farming as cows and milk are the very life and light of agriculture and agriculturists.

Every attempt should be made to reserve pasture lands for the grazing of cattle. Grass as a crop should be grown for the purpose of grazing, because the cattle do not get proper amount of food. They are ill-fed and so become lean and thin. The pastures kept in villages do not now yield good grass and herbs. They have lost their power of producing grass. Every effort should be made to make them more fertile.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In the Central Provinces districts, where rice is the main crop, an average cultivator spends upon his holding at least 8 months. In the slack season, cultivators do nothing at all or run to factories like the Tata Iron Works, Kalimati, simply to sacrifice their lives for a dearly bought gain. They return home diseased and in broken health and spread many epidemics like cholera and small-pox. If they can manage to spin at home, their lives can be made happier and they can do good to the country by supplying hand-spun yarn for which there seems to be a great demand.

(*b*) *Chakra* or *charka* spinning is the simplest and most important home industry. But the difficulty is that the people do not get cotton in sufficient quantity, to keep their *charkas* going for months. If every village can produce cotton so as to keep the empty hands using *charka* for 2 or 3 months, for the rest of the year cotton from bazar or from Government stores opened for the purpose can be obtained. Every hand can thus earn at home two to three annas per day. *Charka* is an unfailing

helper for the poor. The castes which grow cotton and take to *charka* are much better off than those which do not grow and use it. The Aghariya caste of Bilaspur and Sambalpur districts may be mentioned here.

(*c*) Bee-keeping, rope-making, and lac culture are also good, if they can be introduced successfully and can be managed by *local men* (competent men found in the locality where they are started, and not by outsiders or non-local men).

(*d*) Yes, there must be such factories in every tract. But they must be controlled by co-operative banks.

(*h*) Learning and capital are the two main things which can open the eyes of the people sunk in ignorance and misery. Every human being wants to live a happy and healthy life, wants to see that his house, his village and his motherland should be free from diseases and ailments. But he has no means to improve his own environment. Prejudice and old practices also prevent him from making any reforms. It should be the duty of the Government to see that the masses get enlightenment and good employment to make their lives happy and healthy. Every encouragement must be given to *ayurvedic* and *unani vaidyas* and *hakims* to serve the people in time of need and they should be financed to keep useful and necessary drugs for free distribution to the needy poor. Tanks or wells should be dug up by the villagers for drinking purposes in places where they are wanted. Pits, watery and damp places near the village site should be filled up and improved.

QUESTION 20.—MARKETING.—No; there are great defects in the market facilities. I refer to the rice market which is the most important of all. The simple village people who produce corn and go to sell rice to the Marwaris or other *mahajans* do not get the proper and exact return of their goods. The Marwaris profit in the dealing and the village people suffer in every respect. The mode of measuring is unfair and deceitful. The purchasers or the Marwaris are the masters of the village bazars. The rate of rice in a market-centre is 8 seers per rupee while it is selling 6 seers per rupee in Nagpur or Bombay. The Marwaris refuse to purchase rice in a bazar if the sellers do not offer them 10 seers or 12 seers per rupee. The sellers have brought rice from 10, 12 or 15 miles and they would be unwilling to take back the heavy loads on their shoulders or heads. They are compelled to yield to the wishes of the Marwaris even at great losses. To save the villagers from such loss, the rate of the main produce in every important railway centre must be made known publicly to the people on the morning of the bazar day through the agency of village watchmen or police or *patwaris* and every step should be taken to see that no unfair modes are adopted in measuring. In case the Marwaris are not willing to purchase rice or wheat according to the rate fixed in noted centres, the whole stock may be deposited with or purchased by an agent appointed by, or representatives of, such bodies of experts as the Agricultural District Association. One of their main duties should be to see that the village produce is sold at the highest rate and the producers and not the Marwari middlemen get the profit which is due to the producer or village people. In this connection, I may mention that societies should be formed to safeguard the interest of the village people who sell their main agricultural produce in village bazars or in railway station market centres. There should be purchase societies and societies for the sale of produce or stock.

QUESTION 22.—CO-OPERATION.—Co-operation in its true sense is not met with in practice. The officials who engineer and run this department fail to realise that they are for the happiness and betterment of the masses or their members. They more or less adopt the method of a greedy *bania* to accumulate capital. It seems to be more a business concern than an encouraging, helping and patriotic institution. The result is that many agriculturists who deal with it go dissatisfied and the result is that their fellowmen get too discouraged to join the society. The societies formed for sale of produce, cattle-breeding, joint farming and purchase societies can become boons to the masses if they are conducted in the spirit of real co-operation and patriotism. Consolidation of holdings is of great benefit to the majority of agriculturists. It will help them in improving their land and in freeing them from litigation.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The present system of education does not help the agriculturists in any way in bettering their material condition. The high school and college students hanker after service and those who have landed property never care to improve it nor do they take pains to visit and inspect the work of agriculture in their own fields. They are too weak and tender to withstand the hardships of an agriculturist's life. Even the boys who attend primary schools for a period of 4 or 5 years begin to hate their fathers' vocation of tilling the ground and doing "forced and free" labour as is prevalent in many parts of India. The system working at present does not create a taste in the majority of students for

manual labour and hard agricultural work. This work is left entirely to farm servants who are unlettered like the very plough cattle which drive the ploughs. Indian students and graduates return to agriculture when all other efforts to get employment have proved fruitless. And even if they take to agriculture, they can never become better or typical fieldmen.

Agriculture must form one of the compulsory subjects in colleges, high schools, middle schools and primary schools. In village schools, a great deal of practical work of agriculture should be done.

(*b*) (i) Night schools may be opened in some villages as a test and the students there be made to read certain good moral poems and songs and prayers and to write ordinary letters. Other subjects may be taught orally to improve their general knowledge of the world. They may be allowed to do all the household work during the day. The course may be for two years only.

(ii) Compulsory education in rural areas will have to meet with great apathy. People consider it as a trouble. But education must be made attractive to the children by introducing spinning, care of cattle, gardening, carpentry, etc.

(iii) Such boys lapse into complete illiteracy within three or four years. But for Tulsi Das's immortal work "The Ramayan" their four years' labours over the "the three R's" would have been fruitless. Travelling libraries of light literature ought to be introduced to keep up the learning of such boys.

Oral Evidence (through an interpreter).

28777. *The Chairman*: Mr. Purushottam Prasad Pandeya, you have provided the Commission with a note of evidence which you desire to put before us. Do you wish to make any statement at this stage?—I will reply to whatever questions are asked.

28778. Is it your experience that there is a good demand for country vegetables which you mention as a possible source of a new cultivation?—There is a demand.

28779. Where does the demand exist?—In every village.

28780. For consumption in the village?—Yes.

28781. Do you yourself cultivate any land?—Yes.

28782. How much?—200 acres.

28783. What are your principal crops?—Rice.

28784. Any sugar?—Very little.

28785. Are your lands irrigated?—Very little, from village tanks.

28786. Is it your view that there is room for an extension of irrigation?—Yes.

28787. From what source?—From big tanks as they were constructed in 1899.

28788. Are there any streams in your neighbourhood which could be dammed for storage?—No.

28789. Do you lend money?—No.

28790. Are you satisfied with the veterinary service in your district?—I get very little help; it is at a distance.

28791. Are you a member of your District Council?—I am a member of the Local Board.

28792. Does your Local Board control certain veterinary officers?—Yes.

28793. Do you think that a good arrangement?—The management is all right but as they are far off from the interior they cannot come in time to the villages where they are required.

28794. How far from your holding is the nearest Veterinary Assistant?—90 miles.

28795. Is your District Board sufficiently in funds to carry out the maintenance of the roads in its charge?—No.

28796. What is the principal demand from the public: for better roads or for better education, or what?—First education, next roads.

28797. Is there a growing demand for education on the part of the cultivator proper?—There is no real demand but the demand should be created.

28798. On what do you found yourself when on page 126 you express the view that the number of cows is decreasing?—They are not looked after properly; there is a dearth of fodder.

28799. I do not think you understand my question. What makes you think that the number of cows is decreasing at this moment?—It is my own experience that in the neighbouring villages the cultivators who had more cows have now less cows.

28800. *The Raja of Parlakimedi*: What is the reason for the decrease; is it because the cultivators are encroaching upon the pasture land?—No, they do not take proper care of the animals and there is a dearth of fodder. There is some encroachment, and, secondly, those areas which are allotted for the grazing of cattle do not grow good grass.

28801. *The Chairman*: What is the season of fodder shortage in your district?—In the hot season and in the rainy season.

28802. Is there any natural grazing available at those periods?—There is no forest for grazing.

28803. But even if there were grazing available, is it not the case that at certain seasons of the year there would be no grass?—Yes.

28804. So that increased pasturage is not a complete solution of this problem?—Unless there is good grass in the area it will not help.

28805. Is any attempt made to preserve fodder in the flush season against shortage in the dry season?—There is not enough grass for that season, so that we cannot cut and preserve it.

28806. You have mentioned the possibility of introducing lac culture, rope-making and bee-keeping, and you think that it might be an advantage if those industries could be introduced successfully and could be managed by local men. Would you object to their being started by help from outside?—If these industries are started from outside, then the labourers will get employment in those industries but all the profit will go to outsiders, which is not a sound policy. If local capital be used, the profits will go to local shareholders who will have more sympathy with their labourers.

28807. In dealing with the question of co-operation, you complain that societies are managed more in the spirit of the "greedy *bania*" than in one of helpfulness towards the cultivators. Would you give us an instance of what it is you complain of?—Those who are more connected with borrowing should be members of their societies, so that they should have more sympathy with the borrowers.

28808. Have you knowledge of any society in particular?—I do not know, but I think it is possible. In Janjgir, the tahsil headquarters, they have started it.

28809. Have you sufficient grounds upon which to make the rather serious charge that societies are managed in the spirit of the "greedy *bania*"?—I have no proof.

28810. *Sir Ganga Ram*: Are you a Brahmin?—Yes.

28811. Have you all your life been a cultivator, or been living on cultivation?—I have never done anything.

28812. Have you any sons or relations engaged in cultivation or are they pursuing some other occupations such as law?—We have got a joint family and all the members are engaged in cultivation.

28813 *Sir Thomas Middleton*: With reference to the enlarging of these village tanks, you complain of the action of talukdars who insist on having a present before the tanks are enlarged. Could there be any possible harm done to the talukdar by the enlarging of the tank or is this purely blackmail?—The talukdar does not suffer anything thereby, but his consent is simply required and for that he expects some money.

28814. Then again complaint is made of the action of the veterinary officer who sometimes treats the people harshly when he is called to out-of-the-way places. Does the veterinary officer get any fee for his attendance?—He does not charge any fees.

28815. Does he, like the talukdar, expect a present?—No.

28816. You quote a proverb "The cow is the mother of prosperity." Would you agree with me if I changed the proverb to "The well-fed cow is the mother of prosperity"?—Yes.

28817. Do people feed their cows properly in your district?—No.

28818. You say India is the land of cow-worshippers; yet your neighbours do not feed their cows? As a man of influence in your district, cannot you induce your tenants to feed their cows?—I do to a certain extent.

28819. How many cows have you yourself got?—About 40 or 50.

28820. In what season do these cows calve generally?—In December and January.

28821. And when do they go dry?—After 6 or 7 months.

28822. How are these cows fed during the months when they are dry?—On rice straw.

28823. No grain at all?—When they are in milk they get grain.

28824. I am afraid you are not a cow-worshipper: you feed them when they are giving milk but when they are dry you give them nothing but *bhusa*?—Yes.

28825. *Dr. Hyder*: To what is this deterioration of the cattle due? Their breed is deteriorating, their yield is deteriorating. What are the causes of this deterioration?—Insufficiency of fodder and good food.

28826. Would you like to have the rule of *damdopat* applied here?—What is that?

28827. It is a rule of Hindu law that in no case should the debtor be forced to pay more than twice the original principal lent?—I am not in favour of that for all cases, but only in the case of poor tenants.

28828. Would you like to have the Usurious Loans Act applied here?—Yes.

28829. *Sir Ganga Ram*: What is the total area of your land?—600 acres.

28830. And what land revenue do you pay?—Rs. 432.

28831. *The Raja of Parlakimedi*: You suggest on the first page of your note that the growing of vegetables should be encouraged? Is it your view that it should be a bye-industry?—Yes.

28832. You complain about the zamindars not maintaining irrigation sources in proper condition. Is it not possible for the ryots to go to Government for the redress of their grievances?—There are so many tanks that it is not possible for them to repair them.

28833. I am afraid you did not understand me. In my part of the country, if the zamindar fails to maintain the irrigation sources in proper condition, the ryots can apply to the Collector to get them repaired to the extent necessary, and after that the amount is collected from the zamindar as part of the Government dues. Is not that facility prevalent in these parts?—There is no system like that here.

28834. *Sir S. M. Chitnavis*: Is there no mention made about repairs in the record of rights?—According to the record of rights, the ryots are authorised to make an improvement in the village tanks, but the zamindar claims that his consent should be taken before any improvement is made.

28835. *The Raja of Parlakimedi*: When he fails to comply with such a request what steps can the ryots take when it is necessary to irrigate their fields?—They are not prevented from making use of the water, but if they want to improve the supply the zamindar comes in the way unless his consent is taken beforehand.

28836. You suggest that the moneylender should not have a hold upon the land that is to say, he should not be able to proceed against the land to recover his dues. Is it your view that the Impartible Estates Act, which we have in operation in Madras, should be extended to this Province? In Madras there are permanently settled estates which the owners cannot mortgage for borrowing money. Do you want that sort of system to be extended here?—I would like to have it here.

28837. Should it be extended in every case, or would you limit it to people having a certain amount of property?—It should be extended with some limitation.

(The witness withdrew.)

MR. PURUSHOTTAM PRASAD PANDEYA.

COL. H. de L. POLLARD-LOWSLEY, C.M.G., C.I.E., D.S.O., Chief Engineer, Irrigation, Central Provinces.

Note on Irrigation.

Irrigation in the Central Provinces is required mainly in order to ensure a satisfactory outturn from the rice crop. It is also used for cane and garden crops and to a comparatively small extent for *rabi* crops such as wheat, gram and barley.

So far as Government irrigation works are concerned, except in the case of two small works in the Shahgarh tract of the Sauger district, they are now designed solely for the irrigation of rice and, though small areas of other crops are irrigated from certain of these works, it is contemplated generally that the irrigation of these other crops will cease as the extent of the rice area irrigated develops up to the full capacity of the works. In a few cases, where it is known that it will never be possible to use the full capacity of a work for the irrigation of rice the irrigation of other crops will be continued.

2. The statement below indicates the extent to which rice is grown and irrigated in the more important rice growing districts in the Province:—

Division.	District.	Mean monsoon rice rainfall.	Total area of rice grown in 1924-25.	Area of rice irrigated by private works in 1924-25.	Area of rice irrigated by Government works in 1924-25.	Total area of rice irrigated in 1924-25.	Approximate area of rice that it is contemplated will eventually be irrigated by Government works that are completed or under construction.	Percentage column 5 of column 4.	Percentage column 8 of column 4.	Percentage of rice area that will be irrigated both by Government and private works when the Government works now under construction are completed.
1	2	3	4	5	6	7	8	9	10	11
Chhattisgarh.	Raipur ...	46·81	1,532,441	47,672	157,476	205,148	269,289	3·1	17·5	20·6
	Bilaspur	44·26	1,194,141	10,504	2,120	12,624	169,115	0·88	14·1	14·98
	Drug	43·64	698,653	18,903	125,752	144,655	173,235	2·7	24·8	27·5
Nagpur.	Bhandara.	49·99	454,804	65,334	35,206	200,540	42,750	36·3	9·4	45·7
	Balaghat.	60·03	380,193	58,333	83,695	142,028	103,860	15·3	27·3	42·6
	Chanda	45·83	256,447	111,919	22,965	134,884	56,580	43·6	22·0	65·6
Jubbulpore.	Jubbulpore	52·71	183,575	...	7,785	7,785	55,285	..	30·1	30·1
	Seoni	48·20	110,318	22,406	2,794	25,200	14,460	20·3	13·1	33·4
	Damoh ...	45·42	63,186	...	4,457	4,457	15,857	...	25·0	25·0

The districts are placed in the order of their importance as rice-growing districts. The Chhattisgarh Civil Division stands easily first in respect of the total area of rice. The figures in column 9 show, however, that private irrigation barely exists in that Division. Compared with the Nagpur Division, the rainfall is somewhat low and the necessity for Government irrigation is greater in the Chhattisgarh Division

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than in any other part of the Province. It is, however, in the Nagpur Division that the best rice is grown and most of it is transplanted, while in Chhattisgarh, though efforts have been made to introduce transplantation, practically no success has been achieved. No success can indeed be expected until holdings have been consolidated, and even when this has been done development will be obtained only gradually, for the population is somewhat sparse and the cultivators are lazy and unenterprising.

Private irrigation can hardly be said to exist outside the Nagpur Division and the Seoni district of the Jubbulpore Division where the conditions approximate to those of the Nagpur Division.

3. The figures in the statement in paragraph 2 show that when the Government works now under construction are completed and fully developed, the percentage of the area of rice irrigated will be highest in the districts of the Nagpur Division, as it is at present. In the Chhattisgarh Division, where irrigation is most wanted to secure the rice crop, a considerable advance will have been made, but in all these districts of the Division the percentage of the area of rice irrigated will be considerably below that of the districts of the Nagpur Division. On these figures there is a strong case for the construction of further Government works in Chhattisgarh and especially in the Bilaspur district, where the construction of large irrigation works was commenced only in 1920 and no large works have yet come into operation. Four small works, which were cosntructed in the district, have all developed satisfactorily.

There is no doubt that more works are required in the Raipur district but pending the satisfactory development of irrigation from the Mahanadi Canal, it is not possible to justify their construction. In Drug also further new works are required, but it is desirable to deter making definite proposals for such works until the present period of the agreements on the Tandula Canal has expired and experience is gained of the readiness with which agreements are renewed. Incidentally it may be mentioned that the Tandula Canal and its distributaries are being remodelled and this work will occupy most of the local labour that is available during the next few years.

In the Nagpur Division, experience has shown that where water is made available all the dry rice and much of the wet rice that is commanded readily enter into agreements. Local officers anticipate when the present period of agreement expires, that these agreements will generally be renewed without delay. But expansion of the rice area has been slow, especially in the Chanda district, owing to shortage of population. There is, I consider, a good case for the construction of new works both in Bhandara and Balaghat, but not in Chanda where no new works should be undertaken until satisfactory development is secured under those already completed. This development can be secured quickly only by colonisation, a matter which is under consideration.

In the districts of Jubbulpore and Damoh, though moderate success has been achieved in the development of certain works, it cannot be said generally that the irrigation of rice is appreciated. Much of the soil in the area where rice is grown is light and, without manure, it is found that it becomes exhausted and that after a time the irrigated crops are not appreciably better than the unirrigated crops. There is no transplantation in these districts, but *machowa* is practised. Until the manure question has been solved, I do not recommend the construction of further works in the Jubbulpore and Damoh districts.

In the Seoni district two Government works only have been constructed, one of which only came into operation this year. The conditions of rainfall were such that very little irrigation was necessary and no agreements were obtained under this work. Until further experience has been gained of the extent to which cultivators will use Government irrigation in this district, it would not be advisable to start any new works, but the conditions being approximately the same as in the neighbouring district of Balaghat, where Government irrigation is appreciated and freely taken, there seems to be little doubt that the same results will be obtained in Seoni. If this is found to be so, I consider that further Government works should be constructed in this district.

4. I consider then that new irrigation schemes should be constructed in the following districts:—

(1) Bilaspur.	(4) Bhandara.
(2) Drug.	(5) Balaghat.
(3) Raipur.	(6) Seoni.

In Bhandara and Balaghat, there is no necessity to delay the construction of new works. In Bilaspur, it is undesirable to start any new work for two or three years

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when the construction of the Maniari project will have been further advanced. By that time too some information will be available in regard to development under the Kharung Reservoir, and the position under the Mahanadi Canal in the adjoining district of Raipur should be more clear than it is at spresent. In the other districts, it must be shown that, under the schemes that have already been constructed, the results are such as to justify the construction of new works before any new works are undertaken. It is impossible to say with certainty how long it will be before a definite decision can be made, for the readiness of the cultivators to enter into agreements depends almost entirely on the extent to which the rainfall fails, and this cannot be forecasted. Seeing that the last three years have been years of good rainfall, it is not unreasonable to expect a bad year before long and there is little doubt that, on the occurrence of a bad year, agreements will be secured on a large scale and this will justify the construction of new works.

5. The main obstacles to the extension of Government irrigation in the Province are—

(*a*) The high cost of works due to the necessity of providing storage and the difficult nature of the country that has to be traversed by the canals.

(*b*) The uncertainty of income due to the variations in rainfall which are such that, though irrigation is frequently necessary for the production of a reasonably good crop, there are years in which a fair crop can be obtained without irrigation. The cultivator is not unnaturally averse to paying for water when he may not require it. The agreement system has been introduced to meet this difficulty and to a large extent it has met it, but at present delay must be expected in obtaining renewals of agreements if, in the year in which they expire, the rainfall is favourable. This adversely affects the income from works.

(*c*) The high cost of maintenance due to the fact that irrigation is confined almost entirely to the *kharif* season and there is practically no irrigation in the *rabi* season. Works are also scattered over large areas and inspection is difficult.

(*d*) The difficulty of obtaining watercourses. It appears that, unless watercourses are constructed by Government at their own expense, they will never be made on any reasonable scale.

(*e*) The inefficiency of the cultivators, especially in Chhattisgarh. If a higher class of cultivation could be secured and if transplanted rice could be introduced largely to replace broadcasted rice, the cultivators would secure higher profits and a higher rate might be charged. Further, with more efficient cultivation, less water would be used, a higher duty could be adopted and, in many cases, a larger area of irrigation could be effected. As already stated, it cannot be expected that transplantation will be introduced on any scale in Chhattisgarh until holdings have been consolidated and, though this matter is being taken up, it will be some years before consolidation can be effected. Irrigation is far more popular and satisfactory in the more advanced rice tracts of Balaghat and Bhandara than in the more backward areas of Chhattisgarh. Thus under the Waiaganga Canal in Balaghat, with one exception, every village that is commanded has entered into an agreement and it is expected that most of these agreements will be renewed readily when they expire. In Chhattisgarh, though satisfactory results have been secured under the Tandula Canal in the Drug district, the results under the Mahanadi Canal are not nearly so satisfactory and considerable delay has occurred in the renewal of most of the agreements that have expired.

(*f*) Shortage of manure. In light soil areas in the north of the Province and in the Chhattisgarh Division, the shortage is most serious and has a most detrimental effect on development. In some cases, cultivators may refuse to renew agreements owing to their not being satisfied with the outturn of their crops.

(*g*) The case for the construction of irrigation schemes as protective works is not so strong now as when the policy of constructing these works was first introduced. The cultivators are now better able to withstand the effects of a year of bad rainfall than was the case 20—30 years ago.

Oral Evidence.

28838. *The Chairman*: Col. Pollard-Lowsley, you are Chief Engineer for Irrigation in the Central Provinces?—Yes.

28839. You have given the Commission a note of the evidence which you wish to set before us. Do you want to supplement it by any statement at this stage?—No.

28840. Would you, at the outset, tell us what your staff consists of?—We have three circles, each in charge of a Superintending Engineer, and each of these circles has three divisions; the divisions have generally from three to four sub-divisions, and the sub-divisions are divided into sections.

28841. You have provided us with various documents that have been put before the Commission, with an account of the existing schemes. What do you say about the efficiency of the existing schemes?—On the whole, I think they are efficient, that is to say, they can do, on the whole, pretty well what they were intended to do. Of course, some of them do not do what they were intended to do, because we did not know enough about the extent to which water was required when they were investigated. I have given you a figure of 900,000 acres as the area of irrigation that is likely to be done by these schemes when they are fully developed, but I should think that if one went into the details and omitted the area of wheat irrigation which was at one time proposed, one would probably find that the schemes were originally designed to do perhaps 1,100,000 or 1,200,000 acres, or something of that kind; that is to say, they are not as efficient as was originally expected; they cannot do the area they were originally intended to do, but they can do a very fair proportion of it.

28842. When these schemes were devised, was it assumed that the crop systems in vogue before the schemes came in would be persisted in by the cultivator?—Yes; I should say generally it was assumed that there would be no change, though there would be an expansion of the rice area; we did not expect any general change.

28843. The local scheme here, the canal which I see traversing the country-side, is part of the Mahanadi system?—Yes.

28844. Is the main canal there capable of carrying all the water which the cultivators would be prepared to take for rice cultivation?—It will carry a great deal more than they are at present prepared to take.

28845. Was it one idea of the schemes to encourage the growing of wheat?—Originally it was.

28846. Has that mission been fulfilled?—No, it has fallen through entirely; we do not expect any wheat irrigation worth mentioning.

28847. How comes it that that particular object has failed?—We do not expect any wheat irrigation anywhere in the Central Provinces. We now know that in the Central Provinces, except in the Shahgarh tract, which I have mentioned, and to some extent in Jubbulpore, we shall not get wheat irrigation as a general rule. Occasionally, when we get a bad season and there is a small amount of rain in the cold weather, we get a small area of wheat irrigation, but it is negligible.

28848. If you were to start the Mahanadi scheme again with a clean book, would you make the main canal of the same size?—I should not make it any bigger, because with the supplies available, it would not be advisable to make it any bigger. I should probably make it very much the same size, but I might not make it to command such an extended area as it does, because we cannot irrigate the whole of the rice in the area commanded.

28849. Is it your policy to irrigate as much as possible, or to have water in reserve in order to be able to save as much as possible?—Our policy is to irrigate to the full extent of each scheme. We do not hold up the water, that is, we do not calculate on holding up the water from one year to another. That, you will find the Irrigation Commission said, was wasteful and should not be done and we never count upon it.

28850. Are all these schemes, in the technical sense, protective or productive?—There were only three schemes sanctioned as productive, but so far as I can see none will be productive. They used to be called protective, but they are now called unproductive.

28851. What are the three productive schemes?—The Mahanadi Canal, the Wainganga Canal, and a tank called the Asola-Mendha Tank in Chanda. Two of them have been relegated to the unproductive list; the Mahanadi scheme has just been relegated to the unproductive list, and the Asola-Mendha Tank was relegated to that list some years ago. We still have the Wainganga scheme on the productive list, but we are sending up a completion report now and I expect it will also be relegated to the unproductive list, in fact it must be.

28852. *Prof. Gangulee*: What is your partly protective system?—We do not guarantee to give the people all the water they want in the worst year that can possibly occur. The Irrigation Commission said that it was inadvisable to do that; they did not recommend it. The works were started with that idea, but we soon found out that financially it was impossible; in other ways also it is undesirable, because it involves holding up water in ordinary years in order to save crops perhaps once in thirty years, which we should not be able to do if we used the water ordinarily for a larger area.

28853. *The Chairman*: You have given an account of the schemes that have been formulated?—Yes.

28854. Are they productive in nature?—No.

28855. All unproductive?—Yes.

28856. So that, you have here no productive scheme?—We have no productive schemes. I think in this Province it is practically impossible that we should construct schemes that can be classed as productive.

28857. Is that because of the difficulty and expense of storage in relation to the land commanded by the water available?—It is partly that, and partly it is due to the fact that the demand for irrigation is not such that we can charge the rates which can be charged in a country where the demand is constant.

28858. So that it is a much more difficu't problem than in the Punjab?—It is in my opinion much more difficult than in any other part of India.

28859. On the question of minor irrigation schemes, by which I mean the damming of small streams, the construction of small tanks, and the digging of wells, levelling and so on, does all that come within your responsibility?—We have put up a good many small tanks of under 50 million c. ft. capacity, but we have done nothing on wells. We have assisted the cultivators to a certain extent in improving their tanks and we have done work on field embankments on a small scale.

28860. Have you any subordinates on this work whole-time?—No.

28861. Do you think it might be well to have them?—No; I do not think so; I think it is more a job for the people to do themselves. If they want advice and assistance with regard to the investigation of anything of the kind we can do it for them.

28862. Do not these matters require a certain amount of pushing in a country of this sort?—A great deal.

28863. Who do you suggest should provide that?—The revenue officers. The Deputy Commissioner has far more influence with the cultivators than we have, and I think he could push that better than we can.

28864. You do not suggest the creation of a small whole-time staff to investigate and demonstrate?—We found that it was not satisfactory when we took up the improvement of small tanks. Good progress cannot be secured unless the owner of the work takes an interest in it.

28865. So much with regard to your views on the administrative side. What about your opinion as to the scope for the creation of these minor works? Do you think there is much field for them?—When we were investigating the grants-in-aid tanks we looked into it. I was then in the Nagpur Division dealing with the Bhandara and Balaghat districts and we found it extremely difficult to find works which were worth while taking up. We wanted works of a certain size. There was difficulty in finding works of 10 million c. ft. capacity or thereabouts; but if we want much smaller works, say, 1 or 2 million c.ft. capacity, they can be found.

28866. Is it your opinion that from the cultivator's point of view there is much opportunity for either the individual cultivator or for groups of cultivators to undertake these works on their own behalf? I think there is much scope for work on that basis?—It is difficult to say; but I should imagine there is good deal of scope for it in the rice areas.

28867. Is it your opinion that there has been an exhaustive enquiry into the possibility of it?—There has not been a methodical survey. There has been a certain amount of investigation in connection with famine relief works but that was done a very long time ago and I do not know much about it.

28868. It is for that purpose that I suggested to you that you might set up a small whole-time staff for that type of work. If such staff were to be set up, do you think it suitable that your department should have surveillance over it? Yes; as far as investigation goes I think we should do it.

28869. Now to turn to another aspect of the same question, do you think there has been a sufficient survey in this Province with a view to discovering what subsoil water may be available for digging wells?—As far as I know there has been no extensive survey, but it is well known that in the Central Provinces the water level is low and I cannot say that one is going to do much on wells

28870. Are you satisfied yourself that your own information is sufficiently well founded to justify you in laying aside the possibility of developing well irrigation in certain areas? Or would you like to have a further survey?—I do not think further survey is necessary; I think the only place where wells can reasonably be adopted is in the beds of rivers.

28871. We heard to-day from a witness that he had found water at less than 20 feet and was getting very satisfactory results out of a bullock lift, so that, in that district at least, there appears to be available a supply of water sufficiently near the surface?—That is perhaps in a river bed; that is the sort of area where we get shallow wells.

28872. Limiting the problem to the areas close to river beds, do you not think that your department should be in a position to give advice to cultivators, and possibly technical assistance in digging wells?—It is a very simple thing. I do not think assistance is required for digging wells in river beds.

28873. The witness in question had apparently a great deal of trouble with his well; he found it necessary to re-dig it apparently every season?—It is possibly because it was in a river bed.

28874. Have you any staff available to give advice in the construction of *pucca* wells?—We have no staff for the purpose, but if we found it necessary we could always engage temporary staff.

28875. What about your touch with the Agricultural Department; are you satisfied with it?—Quite.

28876. Do you often meet the Director of Agriculture?—Not in conferences; we meet frequently otherwise.

28877. Irrigation schemes have their agricultural aspect, have they not?—Yes. In fact we are up against big agricultural problems; that is one of the main troubles in the Mahanadi area.

28878. Would you develop that idea a little?—The type of agricultural labourer is very poor and the type of agriculture is equally poor; they do not grow transplanted rice and they cannot be expected to grow transplanted rice until they are in a position to do so; they cannot do it until they consolidate their holdings. They burn all their manure; they grow light rice and many of them have large areas in which they do not personally take any interest. The whole position is most unsatisfactory; it is very difficult to make irrigation successful in this part of the world.

28879. Do you mean to say that these conditions taken together mean that the cultivators are not in a position to take advantage of water?—Exactly, yes; they do not get sufficient profit out of their land to pay an adequate rate.

28880. Now on this problem of the method of charging (the amount of the charge is beyond our terms of reference), have you found this contract method satisfactory? —I think it is the only possible method; I cannot see any alternative.

28881. Are you familiar with the method employed in certain productive schemes in certain parts of India according to which the charge is attached not to the crop but to the land itself?—Yes; they have it in Madras too.

28882. What do you think of that scheme?—I think it is inappropriate in a place like this. It involves the compulsory levy of irrigation rates, and, I think, that would be most unpopular. It is unfair to levy a compulsory rate when you do not give a guaranteed supply. I take it, in their case, they do give practically a guaranteed supply, but we cannot.

28883. Would you agree that there are many problems connected with irrigation, and agriculture under irrigation, which still require to be solved?—Innumerable problems, yes.

28884. Would you like to see, under the Government of India, an irrigation research station established which might deal with the more fundamental of these problems?—I dare say it would be useful; but I think really it is a matter that one has to deal with very much more locally. The problems here are local problems, and I do not think you can call them all-India problems, and if we leave them to an all-India organisation I think we are liable to be overlooked. I would rather leave them to local organisations.

28885. You do not think that problems of wastage, problems of water-logging, problems of alkaline land and other basic problems of that sort, could be dealt with by such an organisation?—But we are not concerned with most of those; we are not concerned with alkaline land, nor with water-logging.

28886. What are your problems here?—The main problem is improvement of the cultivation. Where we have got good cultivation we have no difficulty; we use our schemes to the full extent; but where we have bad cultivation we have difficulty; we have got to improve the agriculture before we develop our schemes.

28887. Are you satisfied that there has been no deterioration of the land irrigated?—In certain cases there has been deterioration.

28888. How do you account for it?—People apply water and do not apply manure and they cannot expect improved crops.

28889. Are you satisfied that the manurial problems of irrigated land are understood?—They are not solved; I do not know whether they are understood.

28890. Do you agree that that is a field in which a central research organisation might be useful?—Very likely.

28891. Would you give us, in a rather more detailed manner than you have provided in your notes, an account of the contract system in vogue in the Province?—Under what we call the agreement system the occupiers of 80 per cent (this system is practically only applied to rice cultivation) of the rice area in the village which is commanded by an irrigation scheme have to enter into an agreement before that agreement can be made binding. If we get the occupiers of 80 per cent of the area to agree, then we make it binding on the village; that is under the law. In return for that we give the village favourable rates for irrigation. The rates we charge them are possibly a little more than half the rates they would have to pay if they took irrigation spasmodically and we also give favourable terms of remission. The terms of remission are that if it is an 8-anna crop or less they get half remission and if it is 5 annas or less they get full remission. They get certain advantages and Government gets certain advantages. We have an assured income; they have not an assured supply, but we undertake to supply water whenever they want it to the extent we can, and we do not enter into an agreement with a larger area than we can provide for.

28892. *The Raja of Parlakimedi*: Do you enter into the agreement directly or through the Collector or the Deputy Commissioner?—It is done by the Irrigation Department.

28893. Is that to be confirmed by Deputy Commissioner at all?—No; he does not deal with it at all.

28894. At what periods do you revise rates?—Agreement rates are fixed for a period of ten years; certain rates are fixed and the people know what those rates are when they come into the agreement. I do not mean that we fix one rate for the ten year period; we fix a scale of rates which rises to its maximum in the period of ten years. Other rates are reconsidered every year; that is to say, the local irrigation officers send up any proposals they wish to make each year for revision, and then the matter is considered. All rates, of course, are fixed by the Local Government.

28895. Is the revision done by the Irrigation Department?—It is done in the Irrigation Department by the Member? I should put it up to the Member and he would pass orders on it. But we have a new scheme; we are getting out an Irrigation Bill for the Central Provinces. Under that Bill we propose to have a Board of the Legislative Council which will consider and make suggestions to the Local Government on all proposals for rates. That places the matter within the purview of the Legislative Council; they were very anxious to have it so. Provision for this is included in the Bill, but the Bill has yet to become an Act; I do not know how long that will take.

28896. Does the Irrigation Bill permit private bodies to construct such schemes, enter into contracts in respect of area and rent, and make contracts with the ryots?—As far as I know, there is nothing to prevent them doing so and it is done; but I should not like to say anything about it authoritatively; I know it is done; malguzars charge their cultivators rates in certain cases. I do not know anything about written agreements; I have not heard of any; there may be some.

28897. It is a thing to encourage, is it not?—If it is applied properly; if the malguzar will maintain his tank and issue water to his cultivators, I do not see any reason why he should not charge for it.

28898. So long as it is not prejudicial to people further down?—You mean further down under his tank?

28899. No, separate property altogether. I do not know what the position is here, but in the Madras Presidency if there is a river bed in a zamindar's property it is his, and he can construct a scheme to irrigate his lands as long as it is not prejudicial to people further down: that is to say, people who are outside that zamindari. Is there the same thing here?—You are getting on to the question of riparian rights, and I am not competent to express any opinion on that matter; I do not know.

28900. How are the irrigation rates fixed?—I think, as a general principle, you can say they are fixed at the highest rate which we think we can reasonably take from the cultivator and expect him to pay.

28901. Is it according to the crop he raises?—Yes, different rates are fixed for different crops.

28902. Is the annual or biennial silt clearance in irrigation channels done entirely by the department or do you receive any co-operation from the cultivators under it?—What is done is done entirely by the department, but we do not deal with silt in the Central Provinces; we are lucky in that respect. There is only one canal where we get any silt. Most of our schemes are tank schemes and it is impossible to get silt in tank schemes; we are not troubled with the question of silt. We do all our annual repairs ourselves; we do not get assistance from the cultivators.

28903. Do you ever try to enlist their sympathies for that?—No, we do not; I should think they would object very strongly; we have never even thought of it.

28904. *Prof. Gangulee*: You told us that you were in touch with the Agricultural Department?—Yes.

28905. You realise that the extension of irrigation is often held back by the agricultural situation?—Certainly.

28906. Have any specific problems been suggested to your mind which you would have liked the Agricultural Department to tackle?—There are a great many problems; one, for instance, is the question of manure; that is a problem which they have been tackling. It is especially necessary to tackle it in the north of the Province where they say the outturn of rice instead of improving is deteriorating, and we can do nothing without some suitable manure. They proposed *sann* hemp, but we find that *sann* hemp

cannot be grown without irrigation before the rains, and many of the works in the north are such that you cannot count on providing irrigation before the rains, so that we want something else. There are lots of problems.

28907. These problems, which you state here, were suggested by you to the Agricultural Department?—We suggest them as they arise, yes.

28908. Is there any problem in connection with soil: for instance, the effect on the tilth of soil, or deterioration of soil, due to irrigation?—The only problem concerning the deterioration of soil due to irrigation is the question of outturn without manure; that is the only problem we have of that kind.

28909. In order to obtain the full benefit from irrigation, you think consolidation of holdings is very necessary?—I think it is essential in this area of Chhattisgarh.

28910. Would you advocate legislative measures?—I think they are essential, you cannot do without them.

28911. Your experience leads you to think you must have legislative measures?—Yes; I do not see how you can consolidate without legislative measures.

28912. On page 132 of your note you refer to a colonisation scheme; you say, "This development can be secured quickly only by colonisation, a matter which is under consideration". What is this area?—In Chanda, south of Nagpur.

28913. Am I to understand that you have got a definite colonisation scheme before Government?—No, we have not got a definite colonisation scheme; we have got proposals which are now being discussed; I recently sent them to the Deputy Commissioner there and he is considering them and will no doubt make further proposals. We have no definite scheme which we have introduced. We are considering the introduction of a scheme.

28914. You feel that such colonisation would help the extension of irrigation?—If we can get the colonists, there are large areas of ryotwari land; we can put the colonists on the ryotwari land and get that developed. At present it is uncultivated; they will cultivate this land and we hope in time that some of them will spread into the malguzari areas; the population is insufficient.

28915. And that area which now is uncultivated could be cultivated?—Yes; we are only dealing with areas under irrigation works.

28916. Could you kindly give the Commission the main outlines of your proposals?—The main outline is first to find an area where there are cultivators who are accustomed to growing rice and who have not enough land to meet their requirements. It has been suggested that the Kistna district in Madras is a suitable area. We have made no enquiries in Madras about that so far. The cultivators there, I am sure, are accustomed to very good irrigation and they have silt. The conditions in Chanda are very different from what they are accustomed to; we cannot yet say whether they will be suitable, so that we cannot say where we are going to get our cultivators from. When we have done that, some, at any rate, of them might come and look at the land; if they approve of it they will be given certain concessions. One idea which has not yet been approved, is that they should get rights of transfer; they will be told in advance that they will get rights of transfer; those rights will actually be given to them, but they will be told that the rights will not be confirmed until they bring under cultivation certain definite portions of the area they are given. Wells will be constructed for them, and there will be various minor concessions of that kind; we should do what we could to make them contented.

28917. Can you give us any idea of the area that you might colonise in that way?—Not less than 20,000 acres under irrigation works in that district.

28918. This morning a witness told us that irrigation is not popular; have you heard such views?—I think you will always hear such views in certain areas; you cannot say it is not popular generally, but you can say there are areas in which it is represented to be unpopular, possibly with a view to getting further concessions, or possibly because there may have been a failure at some time which the people have not yet forgotten. I would not say that generally irrigation is unpopular; but to get a proper idea of that you should make enquiries in areas where there is no irrigation and which are contiguous to areas where there is satisfactory irrigation.

If you make enquiries on these lines, you will generally find that the people who have not got irrigation would very much like to have it. If you ask the people who have already got it, they have nothing to gain by saying they like it; they have something to lose, because you might put the rate up, so that you cannot expect them to be enthusiastic

28919. Is the area under irrigation extending, decreasing or remaining stationary?—All our irrigation is done under agreement; if agreements expire in a good year the cultivators will not renew them, and at present our area of irrigaion is decreasing as we have had a sequence of three good years.

28920. Why?—Because this is a Province in which crops can be grown without irrigation; if a man finds in the year in which his irrigation agreement expires that he is going to get a moderate crop without irrigation, why should he bind himself for ten years to pay an irrigation rate when he can postpone it to the next year or the year after when he may get a bad year of rainfall.

28921. Even if he had bumper crops under irrigation?—There is always that temptation; you see we have got to get the occupiers of 80 per cent of the area to agree in order to get an agreement, and a few big holders standing out prevents us from getting that agreement.

28922. Is irrigation a Transferred subject in the Central Provinces?—It is a Reserved subject.

28923. How long will it take to complete the irrigation projects now under contemplation by the Government?—We have a programme of fourteen years which will expire in about ten years hence; as a matter of fact, we shall not complete them all by then; there would be a certain amount of work to be done, but the major portion of the work will be done in about ten or twelve years.

28924. Which irrigation officers come in direct contact with the cultivators?—Of course, all irrigation officers are supposed to come into direct contact with the cultivators, and the lower down you get the more contact there is.

28925. You do not come in direct contact with the cultivators?—I see cultivators and I talk to them when I do see them, but I am not normally in direct contact with them.

28926. Are the men who come in contact with the cultivators sufficiently informed about the agricultural problems of the Province: these revenue collectors and so on?—The Canal Deputy Collectors are revenue officers as a rule; we can appoint either revenue officers or Public Works officers as Canal Deputy Collectors, but we think it politic as a rule to have revenue officers because it brings the Revenue Department into irrigation, which is desirable; they then see our point of view and they are not only useful as Canal Deputy Collectors, but they are useful afterwards.

28927. Are your subordinate officers sufficiently well informed about the agricultural problems of the Province?—They have no agricultural training; they have only got the knowledge they pick up. If you ask me whether they get any knowledge of the agricultural problems of the Province, I should say "No", because they have no chance of learning it; they are concerned with a particular area, and they are probably conversant with the problems of their own areas.

28928. They could be utilised to create a demand for irrigation?—Certainly, it is one of their jobs to go round and talk to the people; they are all supposed to do that.

28929. Do you think some sort of short course in Nagpur would be desirable for these men?—No, I do not think it would do much good.

28930. So that they would view the problem from the right perspective?—No. I do not think there is any need for that.

28931. *Mr. Calvert*: You have said that the first main obstacle to irrigation is the high cost of works?—Yes.

28932. Could you give just a rough idea of the cost per acre irrigated?—I have given a figure in a note* on the Indian Irrigation Commission's Report as to the extent to which we have carried out their recommendations; the figure there worked out at Rs. 75 an acre; that is assuming full development.

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* Not printed.

28933. What do the charges amount to; interest, maintenance and running charges per acre irrigated?—We hope to do the maintenance and running expenses at Rs. 2 per acre; we have not got to it yet; our average at present is something like Rs. 2-8-0.

28934. You have got to add on to that interest charges?—Yes, interest charges are a variable quantity depending on the current rate, and I cannot tell you off-hand what those amount to.

28935. Your minimum charge per acre just to avoid loss must be about Rs. 7-8-0 per acre, including interest charges?—That would be assuming that all our works are productive; none of our works are productive.

28936. What is your minimum charge in order to prevent loss?—I am afraid I could not tell you off-hand; I do not know exactly what the interest charges are.

28937. Who actually pays for the water: the cultivator or the owner of the land?—The occupier.

28938. That is the cultivator?—Yes; it is the man in occupation of the area.

28939. You have mentioned that irrigation leads to a rise in the value of the land commanded; does the owner pay anything?—No, there is no owner's rate.

28940. Who is your immediate superior?—I work under the Revenue Member.

28941. Are you a Secretary to Government?—Yes.

28942. *Mr. Kamat*: On the total outlay on irrigation canals what is the net return in this Province?—At present it is nothing. We can just about cover our working expenses.

28943. *The Chairman*: Is that including interest charges?—No.

28944. *Mr. Kamat*: You have mentioned here as one of your obstacles the uncertainty of getting income?—Yes.

28945. That is because of the rainfall conditions?—Exactly.

28946. That is again because your income depends on the water supplied for requirements of rice, and not sugarcane?—Our works are not suitable for sugarcane; they were not meant for sugarcane; our works were constructed as protective works to protect the areas they covered; the idea is that you can best protect the area by doing large areas of irrigation, and the crop that requires water is rice. If we confined it to sugarcane I do not say we could not do a certain amount of sugarcane, but it would be a comparatively small area; the works would cease to be protective, but a few people would make a large profit.

28947. You are working in friendly co-operation with the Agricultural Department?—Yes.

28948. Would you prefer that irrigation should be a Transferred subject and that irrigation should be under the same Minister as agriculture?—No; I would prefer that it was not.

28949 You would not like that?—No.

28950. Have you any objection to telling us why you do not like it?—The real reason why I do not like it is that I think as far as possible irrigation should be kept out of politics. Irrigation is a very difficult subject and it requires a lot of consideration. If it were under a Minister something might be done which would upset the working or efficiency of our schemes; as long as it is Reserved there is not the same chance of that happening.

28951. Do you mean there is a danger to schemes proposed by the irrigation officers?—There might be, yes.

28952. Or a danger to the services?—No, I was not thinking of the services; I was thinking of the efficiency of irrigation.

28953. The efficiency of the actual administration you mean?—The efficiency with which the schemes are worked, the efficiency of the irrigation.

28954. So that you do not apprehend that the schemes would be rejected, but you apprehend that efficiency in the department would go down?—I say it might. I do not apprehend difficulty about money for new schemes or anything of that kind, because I do not think there would be that difficulty. I think Ministers are just as anxious as Members that irrigation schemes should be made, but it is the organisation and the management of the department in working the schemes that I was thinking of; that might be upset; I do not say it would, but it might.

28955. I am not quite clear why you should have that apprehension as to the efficiency of the Irrigation Department as compared with the efficiency of other departments which are under Ministers?—I cannot give an opinion in regard to other departments; but Ministers are naturally more affected by political pressure than Members, who are not concerned to the same extent with political opinions.

28956. I want to know what actually is the great difficulty?—There is no difficulty; there is a danger.

28957. Owing to the complicated character of the administration of this particular department?—Because this department requires so much more careful management in my opinion than most other departments; it is much more easily upset. Let me give you an example: you might get a big agitation for reducing rates; the Minister might feel he could not hold out against it and he might permit it. A Member is very much less likely to do that.

28958. Then you think the revenue would suffer?—Not only the revenue. Another way in which you can put it is that you might have a big agitation for reduction of maintenance costs. We know perfectly well that our maintenance costs are what would be considered by the outside public to be high. The outside public cannot judge, but the Minister might not realise that; he is naturally affected by the opinion of the outside public and the politicians. We wish to avoid any danger of that kind. We should keep down our cost of maintenance as far possible, but we cannot do with a smaller establishment or keep the works in efficient order by spending less money. It might, however, be difficult to convince the Minister that that was so.

28959. *Sir Henry Lawrence:* Can you tell me how this agreement system works? What is it the cultivator agrees with you to do?—He agrees to pay a certain rate for the whole area cultivated with rice in his village in every year during the term of the agreement, in return for our giving him a favourable rate. He pays whether he irrigates or not, but he gets remissions if his crops are not good.

28960. He has no definite right to the water?—He has no definite claim to any certain quantity of water. He has the right to a fair share, and it is our business to distribute it fairly, but he cannot complain because he does not get as much as he would like.

28961. Do you and your officials see that the water is distributed in rotation when it is short?—We have not worked any rotation system here; we design our scheme so as to distribute the water over the whole area at the same time.

28962. Are you anticipating a much larger demand for water in the future than you have now on the existing canals?—There are many works which are not anything like fully developed. We hope eventually to develop them fully and to get very much larger areas of irrigation than we have at present.

28963. You mean that the whole of the water available is not taken?—Not at present.

28964. What proportion is not taken?—The figures I gave in this note include the schemes under construction, which have not yet come fully into operation. The present area of irrigation is about half what we expect to cover eventually.

28965. Can you give me the figure for your completed schemes?—I have not taken that out separately. I could get it out for you.

28966. Will you do so?—Yes.

28967. *Sir Ganga Ram:* Have all the recommendations of the Irrigation Commission been carried out in this Province?—I have sent in a note* about that. I was asked for a note on the action taken on the recommendations of the Irrigation Commission. We have carried out their recommendations almost in full, except in regard to the manner in which the rates should be assessed.

28968. Was the Mahanadi scheme one of the recommendations of that Commission?—The Commission thought a number of small schemes might be constructed from the Mahanadi. We have constructed one large scheme.

28969. Are you aware that in the first part of the Irrigation Commission's Report it is said that 37 per cent of the water goes back to the sea? How much of the rainfall in this Province is used for irrigation and disappears by evaporation, and how much goes into the rivers and is lost?—I could not tell you, but only a small proportion is used for irrigation.

28970. The Commission must have calculated that figure on some basis, and they must have worked out the figure Province by Province?—I have never seen any figures.

28971. They do not give any. If you multiplied 40 inches, which is the lowest figure by the whole area, could you not tell us how much is used for irrigation?—One could arrive at a rough approximation.

28972. It is very important?—Even then, one would have to take private irrigation works into account. It would be a very rough approximation.

28973. When you recommend a project to the Secretary of State, whether as productive or protective, how much acreage rate do you count on?—In the old days, when the Irrigation Commission wrote their report, they said we would be lucky to get Rs. 2 an acre. At that time working expenses were put at 8 to 12 annas an acre. Both these figures have radically changed. It is now possible to get up to Rs. 4 an acre.

28974. And your working expenses have increased also?—Yes.

28975. What, then, is the basis of your calculation when you submit a project to the Secretary of State?—We base our calculations on the rates that are in force in the area or in an area contiguous to that in which the project is situated. At present we always allow Rs. 2 an acre for maintenance and working expenses, because we hope to work to that rate; but we are actually working at Rs. 2-8-0.

28976. What about the acreage rate?—We generally put in our agreement rates for the nearest similar area.

28977. I want to know on what basis you make your recommendations to the Secretary of State, *i.e.*, that a project will bring in so much, less working expenses so much, etc.?—We take the rates prevailing in the nearest similar area. On most places our charges are on a scale which runs up to Rs. 3, Rs. 3-8 or Rs. 4 an acre.

28978. What do you take as an average? Rs. 4?—No. We take the actual average as it would be according to the scale.

28979. But when you submit a project to the Secretary of State, what do you put down to prove whether it is productive or protective?—We put in Form 155, financial forecast. We give a forecast for each year of the period up to a date ten years from the proposed date of completion of the project. The income is calculated from that.

28980. Have you had any productive projects sanctioned by the Secretary of State?—Yes, three.

28981. Are they likely to be productive?—Two of them will not be, within any reasonable period. The third may possibly be productive in time, perhaps in twenty to thirty years. They will have to be struck off the productive list.

28982. Can you strike them off yourselves?—I am not sure.

28983. Will you have to make a further representation to the Secretary of State to do that?—In the only case of that kind I have had, we had to send it to the Secretary of State in connection with another question, and then we said it would have to be relegated to the unproductive list. The Government of India agreed and said we should do so. I think we have the power to do it.

*Not printed.

Col. H. de L. POLLARD-LOWSLEY.

28984. When making your calculation as to the return a project will give, do you take account of the enhancement of revenue that will occur?—In certain projects which have been sent up that has been allowed for, but we have come to the conclusion that our enhancement of revenue will be very small indeed, because such enhancements are limited. You can only make a certain percentage enhancement.

28985. That is of the ordinary revenue, but not the water advantage rate. Even when the water advantage rate is taken into account, do your projects still prove unproductive?—We get no appreciable indirect revenue here.

28986. But when you submit a project, whether productive or protective, you must show what the revenue enhancement will be?—We show what we expect to get but it is a very small figure.

28987. Will not it increase their production?—Yes, but we get only a small amount from it, because the full enhancement which is usually made can be made without it. The credit we get is very small.

28988. What portion do you get credited?—I think when we sent up the revised estimate of the Waingaga scheme we said we hoped to get Rs. 60,000, but the Government of India cut it down to Rs. 30,000.

28989. Do you take any interest in the increase of wells?—We have nothing to do with wells.

28990. We were surprised to hear this morning from a very notable zamindar that they have no way of getting information as to how to make a *pucca* well?—The Agricultural Department have done a certain amount of work in that direction. They had an Agricultural Engineer.

28991. Is it a great scientific matter to make a *pucca* well?—No. I should think the District Councils might deal with it. It would be difficult for us to do so; we have enough work to do.

28992. Is there no lift irrigation here?—None, except on a small scale.

28993. None on a big scale?—No.

28994. Is there no possibility of it?—I can see no necessity for it.

28995. Not to bring dry areas under irrigation?—You could probably do it better by direct flow.

28996. But you do not do it?—We have done well, on the whole. We only started irrigation in this Province after the Irrigation Commission's report came out. There was no irrigation here before that. That was only twenty-three years ago.

28997. A prominent zamindar told me that the crop here fails sometimes for want of one watering?—That may happen.

28998. Do you not think some means of giving them one watering might be found?—The only satisfactory means is to construct more works or larger works, or to limit the area we irrigate from our present works if we find them insufficient for the whole area.

28999. When you distribute water, what duty do you allow at the outlet?—For rice it is 80 acres to the cusec at the outlet.

29000. You distribute on that basis?—Yes.

29001. Is not that a very low figure? We get 200 in the Punjab?—It may be a low figure, but we have to do everything we can to encourage people.

29002. You say that sometimes you have not enough water. If you raised the duty you might have it?—The first thing we have to do is to get the cultivator contented, and in order to do that we have to give him what he regards as a sufficient supply of water. If we do not do that he will never be contented.

29003. In my experience, the zamindar is never content with the water he gets?—That is so.

29004. We are all fighting for water?—We have to make him sufficiently contented to ensure his entering into an agreement with us; otherwise he will not do so.

29005. Is agreement the great goal of irrigation here? You cannot do without agreements?—I am afraid it is impossible. It is obvious that where you have an area where people can grow fair crops without irrigation, you must have an incentive to make them pay for the water.

29006. They cannot grow wheat without water?—They very seldom require any water at all for wheat. Generally it does not pay them to take water for wheat; it is not worth their while.

29007. Why? You have a large area under *juar*?—Yes, but it does not pay them to take the water. If it did they would, but we know from experience they do not.

29008. Has any research been carried out on that?—I think the Agricultural Department has done a good deal.

29009. Why are they taking to *juar*?—They have always grown it in this Province.

29010. But you could divert them to some better crop?—We hope in time to divert them to rice. Rice is the crop we are after. It is the one crop which does require irrigation and is grown on a large scale in this Province, and it is the crop for which the people in the old days constructed their own tanks.

29011. Can you tell me what delta of water is required for maturing rice?—You cannot generalise about irrigation in the Central Provinces; conditions here vary every year.

29012. Eliminating the figure of rainfall, how much delta is required?—The figures for transplanted and broadcasted rice differ; I think they are something like 3 feet and 3 feet 6 inches. That is the absolute minimum, but please do not take those figures as authoritative.

29013. Are the people content with 4 feet 6 inches?—If we gave them that we should be doing well, but we do not distribute anything like that.

29014. Do you keep your outlets always flowing?—No; we have to be economical about water here.

29015. Do you not work the rotation system?—No. When we are working with tanks, as we mainly are in this Province, the whole idea is to hold up our water until it is essential that we should deliver it. There is nothing here like the continuous flow you have in the Punjab. We hold up our water until it is necessary to give it to the cultivator, and then we give it to him in a limited time. That is why we have a low duty.

29016. Do you site your tanks on a watershed, so that the water can flow?—There are many considerations to be borne in mind in selecting sites.

29017. Could you put them in valleys and pump the water up to a good canal?—I suppose we could, but it would not be economical.

29018. You cannot say that without working out the figures?—Unless there is some particular area that especially requires water and we cannot possibly irrigate it by flow, it would not be economical to introduce pumping.

29019. The ordinary way of making a tank is to put a *bund* across the lower part of a valley. If you do that, the water will have to be pumped out?—No, we should irrigate the area lower down.

29020. Do you ignore sites where the water is lower than the ground level?—We first decide what district we want to have a tank in.

29021. Have you any tanks with high retaining walls, with masonry dams?—We have only a few small masonry dams. This country is not suited to them.

29022. Are your dams practically all earthen embankments?—Yes.

29023. Has your cost of labour risen since the War?—Yes, very considerably.

29024. How much?—40 per cent to 50 per cent.

29025. Have your acreage charges gone up accordingly?—We keep them as high as we can; that is one of our principles here; but at the same time we try to keep people contented.

29026. That is a word I do not understand?—I will define it for you. A contented cultivator is one who is willing to renew his agreement. That is all we want him to do.

29027. Could you make out a statement showing how much water flows away from the Central Provinces?—It would be very difficult.

29028. The Irrigation Commission said definitely that 37 per cent was lost. They must have made some calculation to arrive at that figure?—They must, but I think they must have been cleverer than I am.

29029. *Dr. Hyder*: They have not disclosed that information.

Sir Ganga Ram: No, they have not published their calculations, but they say definitely that 37 per cent goes to the sea.

29030. *Sir Thomas Middleton*: Your system of irrigation is directed almost exclusively to the rice crop?—Yes.

29031. And you irrigate 1/5th to 1/6th of the total area of rice in the Province?—That includes the private irrigation works.

29032. You point out two obstacles to increasing the area of irrigated rice, the first being fragmentation of holdings?—That is a serious obstacle in this Division.

29033. In another case you say the obstacle is lack of manure; the fact that on irrigated land the soil rapidly loses fertility?—Yes.

29034. Have you, or has the Agricultural Department, given special attention to the manuring of these areas which are found to deteriorate rapidly in quality?—They are still investigating them. They proposed that we should use *sann* hemp, and we tried it, but we cannot use it on a big scale because we cannot water it when it requires water, which is at the end of the hot weather. In the tracts in the north of the Province, where this occurs, we have not got the water then. There are also caste objections to growing *sann* hemp, and in many villages the people refuse to grow it. We are now considering oil-cake as an alternative. I understand there is a chance of oil-cake being suitable, if we can obtain it on a sufficient scale at a reasonable price.

29035. *Sir Ganga Ram*: If you could get a good price for the oil it could be done?—Yes.

29036. *Sir Thomas Middleton*: The problem is not yet solved in this district?—No.

29037. I understand all the water you have available is not taken up, and you often have a surplus?—Almost always there is a surplus.

29038. Has any effort been made to induce cultivators to take that surplus at very low rates for the growing of fodder crops?—No.

29039. Do you not think when you have a surplus to dispose of you might make tempting offers to get cultivators to grow fodder crops?—Yes, but so far we have had no demand. We have tried to push it, but there is no demand for fodder crops. It is only occasionally, round the Jubbulpore area, that there is a demand for fodder. The cultivators have never asked for it.

29040. Sugarcane is the only crop other than rice for which any appreciable quantity of water is taken?—Yes. People are keen on sugarcane.

29041. *Dr. Hyder*: You say the cultivators are not willing to renew their agreements, and you define a contented cultivator as a person who is willing to renew his agreement. Where does the trouble lie? Have you found out?—Yes. A man enters into an agreement and may be quite satisfied with it. At the end of ten years it expires. In the year it expires it may be that the rainfall is good; there are years when a bumper crop can be had without irrigation. There is then no object, from the

point of view of the cultivator, in paying for irrigation, and he puts off his renewal till the following year, and goes on in the hope that he may not have to renew it for some time.

29042. Everybody knows that crops can be grown without the help of irrigation? —Yes.

29043. But sometimes (say once or twice in ten years) they cannot be grown at all without it?—It is not quite so bad as that.

29044. At any rate, the crops will be seriously damaged?—Yes.

29045. This knowledge is possessed by you, by the cultivators and by the Members of the Council?—Yes.

29046. Then why is it that the cultivator, knowing this, is unwilling to renew his agreement?—Because he knows that when the bad year comes he can renew it.

29047. But then he has to face the demand rate, has he not?—No. When the time comes that it is absolutely essential to have water, he says "Now I want to enter into an agreement", and we cannot refuse unless we have taken up such an area that we cannot take on more agreements. He may be kept out because other people are taking the water, but that is the only risk he runs, and in many cases that is not a real risk at all.

29048. The cultivator undertakes to pay you a certain rate for irrigation?—Yes.

29049. What do you undertake to do?—To give him water when he requires it to the extent to which it is available.

29050. I submit the trouble lies in your last phrase "to the extent to which it is available"?—We cannot do more.

29051. I think the trouble here is this that the area from which agreements are entered into is considerably larger than the area which you can serve with your existing supplies?—I do not agree. I think our area is very fairly fixed. We have recently considered the question of the development of our works, and in doing so we take all the records of each work from the time it began, and then we decide what area a work can fairly be expected to irrigate.

29052. *Prof. Gangulee*: You always have a surplus?—I cannot say always. When we have our works fully developed we ought not to have a surplus in certain years, but where the works are not fully developed there is generally a surplus. If you look at the Irrigation Commission's Report you will see one of the points they considered was whether complete or partial protection should be afforded. At that time complete protection was proposed by this Province, but the Commission said "you cannot afford to do it", and that is true.

29053. *Dr. Hyder*: I agree with the advice expressed in that Report, and I approve of the system you have in force here; but the fact that the cultivators are not willing to enter into agreements shows there is some trouble somewhere?—Yes.

29054. The Taxation Committee's Report says, "In the Central Provinces, where the agreement is largely to the advantage of the Government, the occasional rate is considerably higher than the agreement rate." Do you agree with that remark?—Yes.

29055. Considering the fact that the agreement system works to the advantage of Government, do you not think that it would be desirable to guarantee the supply also?—We cannot do it; you are going back to what the Irrigation Commission said could not be done.

29056. The duty of water is 80 acres to the cusec?—Yes, at the outlet.

29057. Do you know what is the capacity of the reservoir?—We fix our duty on the tank; no two tanks have the same duty, the duty depends on the capacity of the tank compared with the rainfall, on the yield from the catchment area and also to some extent on the size of the scheme, because we have got to take our losses in the channels into account.

29058. But, taking any particular tank or reservoir, you can soon calculate how many areas could be irrigated to bring your crop to maturity with so much water?—Yes, in a certain year, but not generally.

29059. Then when the rains fail and the cultivator wants water and says "Well, it is up to you now to fulfil your part of the agreement"?—We do; we give him all the water that is available; we cannot do more.

29060. But when the crop cannot be brought to maturity?—Then we give him the benefit of remissions. We have a certain scale of remissions. For instance, if he gets only an 8 anna crop he is given half remission.

29061. *Sir Ganga Ram*: I forgot to ask you about hydro-electric schemes. Have you seen Mr. Meares' survey of hydro-electric schemes?—Yes.

29062. He shows several falls in this Province. How do you propose to take advantage of them?—I have sent in a statement showing all the falls that have been investigated and also what power it was considered could be produced by each of those schemes. But no schemes have been constructed in this Province.

29063. What percentage of the whole area of the Central Provinces is Government land?—You mean ryotwari land?

29064. Can you give me a rough figure in acres?—I am afraid I have no idea.

29065. Have you got a contour map of the whole Province?—No, there are levels of course on the Survey of India maps. Some of them are contoured; I do not think that all of them have been contoured yet.

29066. How far apart are they?—I think 50 feet

29067. Meares' map shows 30 or 20 feet I think?—I do not remember that, but it is a long time now since I saw the map.

29068. I will send you that map. Would you mark the irrigated areas and dry areas and all that sort of thing? I have got the maps of other Presidencies?—I can mark all our schemes. But I sent you a map with the note on the Irrigation Commission's Report.

29069. That does not deal with hydro-electricity?—I sent you another map showing the position of the hydro-electric schemes that have been investigated.

29070. Is no subsoil survey made?—No.

29071. You cannot tell the depth of the spring level anywhere at any place?—We can only tell it by examining existing wells. The wells in every village are nearly always deep wells.

29072. You have not conducted a survey?—No.

29073. Are any wells used for irrigation purpose?—Yes, there are generally *kulcha* wells in river beds.

29074. How can *kulcha* wells stand?—I suppose they dig them out every year. There is one part of the Province where they irrigate their lands, in the Shahgarh tract, and that is an area where the irrigation of wheat is essential. We have built two little works there and straightaway we have got Rs. 4 an acre.

29075. Cannot you advise them how to make *pucca* wells?—We do not want them to, because they take all our water as it is found to be more convenient.

29076. When they come to the water level, how do they increase the depth of the water? How is the water retained in the place? Is the soil rocky or firm?—I do not think it is rocky; I think it is a light soil.

29077. If it is light soil, then it must fall in?—I think a great many of these wells were *pucca* and directly we introduced the irrigation scheme from which they get irrigation by flow they abandoned all their wells and took to our irrigation.

29078. In examining the Meteorological Officer at Simla we were told by him that if he had the funds he could foretell three months ahead the exact nature of the

monsoon which would come in. I pointed out to him that the present forecast is of no use to the zamindar or the irrigation officer, because a forecast of only 24 hours is no good. If he were able to tell us three months beforehand what the character of the monsoon was likely to be that would be very valuable information for you, would it not?—We should very much like to have it, but I cannot say off-hand what use we would be able to make of it.

29079. *Mr. Calvert*: Could you kindly work out the total cost to Government per irrigated acre and the total return to Government per irrigated acre?—That is on the present areas of irrigation?

29080. Yes, all charges?—Very well.

29081. *Prof. Gangulee*: What percentage of the total number of agreements is not renewed?—We have just got to the stage when the first agreements have fallen in. Unfortunately this has occurred in the Mahanadi area which is the most difficult area from which to get agreements. I cannot give you the exact figures but I should think that something like 140 agreements have fallen in during the last two years, out of which something like 20 only have been renewed. The last two years have been years of good rainfall.

29082. "I find from this note which we have submitted to us that the total expenditure on irrigation work is something like 5½ crores?—Yes.

29083. Is there no return on that expenditure at all?—There is no direct return.

29084. You state here that you expect to get some sort of return within thirty or forty years?—The Irrigation Commission stated that you could construct works in the Central Provinces but you would be lucky if eventually you get a return of 1 per cent. Of course that does not take into account the interest charges after paying for the expenses of maintenance and management. We have got to the stage where we pay for our maintenance and management, but we have not yet got 1 per cent return. We will no doubt get it eventually. But I must make it quite clear that these works were never expected to pay.

29085. And your view is that if you can make this agreement system popular you can make irrigation pay some time?—We certainly would be able to make our 1 per cent.

29086. Is there any Irrigation Board in this Province?—No. There is a Council Committee on Irrigation and all important proposals are placed befor this Committee. It is not entirely a Council Committee for we have three or four members of Council on it and a couple of men who are not members of Council.

29087. Are there any non-officials on that Committee?—They are all non-officials except myself and the Member-in-charge.

29088. Was it lately formed?—It was formed about three or four years ago, soon after the new Councils came into being.

29089. *Sir Ganga Ram*: Who appoints that Committee?—Government. We originally intended that it should comprise only Members of Council, but in those days we could not get enough men interested in irrigation from the Council, and we appointed outside men. But now as far as possible Members of Council are appointed.

29090. Is the question of agreements under the purview of the Minister or under the Council?—The Irrigation Standing Committee can deal with anything.

29091. Can they ask questions in the Council?—They can ask any question they like.

29092. Whether the agreement is excessive or not?—Anything they like.

29093. Would that be in their jurisdiction?—Certainly. We would then give them a reply telling them all about it.

(The witness withdrew.)

COL. H. de L. POLLARD-LOWSLEY.

APPENDIX.

Statement showing the financial position in regard to irrigation works in the Central Provinces for the year 1925-26.

Capital sums expended on works for which Capital and Revenue Accounts are kept. (Direct charges.)	Capital sums expended on works for which neither Capital nor Revenue Accounts are kept. (Works expenditure.)	Total income for 1925-26 (including indirect revenue).	Working expenses for 1925-26.	Interest charges.	Indirect charges.	Total columns 4, 5 and 6.	Net loss.	Remarks.
1	2	3	4	5	6	7	8	9
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
(1) 5,20,75,935	...	10,01,679	10,43,668	22,28,079	86,343	33,58,090	23,56,411	(a) Establishment and tools and plant charges are not recorded in the Finance Schedules separately under construction and maintenance for works for which no capital and revenue accounts are kept and hence they are not included in these figures.
(2) ...	(a) 44,64,789	(c) 1,34,198	2,27,602	(b)	(b)	2,27,602	93,404	(b) Interest and indirect charges are not worked out for works for which no capital and revenue accounts are kept.
								(c) Indirect revenue is not credited to works for which no capital and revenue accounts are kept and hence it is not included.
5,20,75,935	44,64,789	11,35,877	12,71,270	22,28,079	86,343	35,85,692	24,49,815	

APPENDIX.—*Concluded.*

—	Net area assessed in 1925-26.	Area irrigated in 1925-26.	Capital cost per acre assessed.	Capital cost per acre irrigated.	Income per acre assessed.	Income per acre irrigated.	Total cost annually to Government per acre assessed (column 7 ÷ area assessed.)	Total cost annually to Government per acre irrigated (column 7 ÷ area irrigated).	Remarks.
	Acres.	Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Works for which both Capital and Revenue Accounts are kept.	362,062	396,198	*144	*131	2·7	2·5	9·2	8·4	* Worked out on the direct charges.
Works for which neither Capital nor Revenue Accounts are kept.	45,788	46,866	†98	†95	2·9	2·8	4·9	4·8	† Worked out on works outlay only.

Mr. CHHOTELAL, Extra-Assistant Commissioner, and Mr. G. P. BURTON, I.C.S., Deputy Commissioner, Raipur.

Mr. Chhotelal and Mr. G. P. Burton were examined on the Note on the Consolidation of Holdings in Chhattisgarh (reprinted below) by Mr. J. F. Dyer, I.C.S., Commissioner, Chhattisgarh Division.

Chakbandi is the term commonly used in Chhattisgarh to denote the consolidation of holdings. While the operation of Hindu and Mahommedan law tends everywhere towards the sub-division of holdings, the evil of fragmentation is, in this Province far more serious in the Chhattisgarh Division than elsewhere owing to the evil effects of the now obsolete practice of *lakhabhata*, which was a device to equalise the holding of land by a periodical distribution of the fields in the village so as to ensure that each cultivator got his share of the different kinds of land. The result is that it is common to find in all the rice areas of the plain of Chhattisgarh a holding of, say, 10 acres distributed all over the village area in about 40 little plots of land. This extreme fragmentation of holdings is an obvious bar to the advance of agriculture, and the establishment of large Government irrigation work makes the evil all the more apparent and a remedy all the more desirable, because fragmentation renders the economical distribution of water an impossibility and the transplantation of rice, which the establishment of an assured water-supply makes possible, cannot be carried out by people who have to waste much of their time in travelling from one scattered plot to another, because the operation of transplantation must be done during a definite and short season and therefore must be carried out at high pressure.

2. The existence of the evil is obvious. The cure is also obvious. Everybody is agreed on these two points. The difficulty is to evolve a procedure which will effect the cure. This note deals entirely with Chhattisgarh. The evil there, being the greatest, must be tackled first.

3. Complete consolidation, that is to say, the reduction of each cultivator's holding to only one plot of land, is neither possible nor desirable. Firstly, even if large cultivators, who hold land in many villages, are left out of the account, quite small men have frequently separate plots of land which, though not far apart, are in separate revenue villages, the lands of which are cultivated from one centre of habitation and cultivation. Even if all the land of one man is in one village, it is only in exceptional villages that it would be to his advantage to have all his land in one block. A village may contain light, heavy and medium soils, irrigated and unirrigated rice-land, non-rice land suitable for wheat and other cold weather crops, garden land and sugarcane land. Consolidation should therefore be, it is universally admitted, by blocks of soil, locally known as *khars*. A man who has several kinds of land at present will not be content with any scheme of consolidation which gives him land of fewer kinds, and quite rightly so, as the possession of land of different kinds and suitable for different crops is an excellent insurance against the vagaries of the season. Consolidation by *khars* is therefore the object to be aimed at. If the nature and the lie of the land makes only one *khar* feasible, so much the simpler the task.

4. The little consolidation that has been carried out so far has been the result either of the deliberate efforts of the Government or of the people usually the landlord alone, acting without the intervention of the Government. Government effort has attained little success, because it has not been sustained, and busy Deputy Commissioners or other revenue officers have been asked to do what they could in the time they could spare from their other duties. The task, however, requires undivided attention and unremitting patience, and not every man is temperamentally suited to it, whatever his other merits may be. The careful selection of the personnel of the *chakbandi* staff is therefore an essential condition of success.

5. Mr. H. M. Laurie as Commissioner, Chhattisgarh, in 1905 first attacked the question. Settlement operations were then in progress in the Bilaspur and Raipur districts, the Drug district not yet having been constituted out of parts of the other two. The two Settlement Officers were directed to make an effort towards consolidation. In the Bilaspur district, success was attained in the village of Nandal, now in the Bemetara tahsil of the Drug district, but the village was in no way typical of the

difficulties of *chakbandi*, because the home-farm having been already consolidated by private effort, the malguzar had no axe to grind in the operations and because the village, being partly a wheat one, had not the minute sub-division of the typical Chhattisgarh rice village. In Raipur the Settlement Officer made an effort himself in one village and issued instructions to guide an Assistant Settlement Superintendent in 19 villages. The Assistant Settlement Superintendent was Mr. Chhotelal, now an Extra-Assistant Commissioner, and I have had the advantage of discussing his operations with him. He is of opinion that with continued effort he would have succeeded, had there not been legal difficulties and had not the Local Government ordered the discontinuance of the operations early in 1907. The orders of the Local Government assigned no reason but merely stated that the Chief Commissioner, after careful consideration, had decided not to proceed further in the matter, but it is clear from the report of the Settlement Commissioner on which the Chief Commissioner's orders were based that unwillingness on the part of the people to fall in with the idea, the impossibility of achieving results which could be incorporated in the settlement records then in preparation and legal difficulties, which I need not go into now, as alterations in the revenue law have removed some of them, were the reasons why the experiment was abandoned.

6. A new attempt was made in 1912, the initiative being taken by the Local Government, which was impressed by a perusal of what had been achieved, in Austria and by the increased importance of the question owing to the construction of Government irrigation works which had been in progress from the early years of the century. Little however resulted and I can best explain the failure by giving the facts of the Bilaspur district. The late Mr. Bell, the then Deputy Commissioner, set to work with enthusiasm. He succeeded in full in three small villages, one of which was in the malguzari portion of the district and the other two in zamindaris. None of these villages was however typical of the *chakbandi* problem. They were small and each contained fields which were large for Chhattisgarh and the distances between the scattered portions of holdings were consequently short compared with those in the average village. The *chakbandi* was done on the principle of three or four *khars* and has stood the test of time. Mr. Waterfall, the present Deputy Commissioner has recently visited the malguzari village. Surighat in the Mungeli tahsil, and has found that the people are quite content with the new arrangements, but the malguzar of the village, when he attempted *chakbandi* in his neighbouring village of Mohtara on his own initiative, succeeded in consolidating his own home-farm but not the tenants' land. More significant than Mr. Bell's success in these three villages was his failure in two villages of the Bilaspur tahsil. In one Mopka, the proprietor applied for *chakbandi*, but the effort to carry it out failed. In the other village, Bahitarai, the consolidation was actually worked out on paper, but the attempt completely failed on account of the firm opposition of some of the tenantry. In this village there has since been a very disputed case for partition among the proprietors which recently came before me on appeal. The spirit of unwillingness to come to an agreement about the partition probably goes a long way towards explaining why the consolidation effort failed. Good will on the part of everybody, except in so far as legislation can empower the will of the majority to prevail over the opposition of the minority, is very necessary for success, and the operations which I hope will now be undertaken should not be prejudiced by making attempts in villages where faction fights and such like impediments to progress exist. The history of the efforts elsewhere in the Division need not be gone into, as Bilaspur is a sufficient illustration.

7. Everywhere in the Division, but more in the Janjgir tahsil of the Bilaspur district than elsewhere, some consolidation has been done without the help of the Government. For future operations this private consolidation is both a disadvantage and an advantage. I mention the disadvantage first, because unless this point is made clear future operations will be hindered. I have had a register prepared showing what has been achieved in 27 villages of the Janjgir tahsil, and I understand that there has been a little consolidation in a few more villages not included in the list. This consolidation has been almost though not quite entirely in the malguzar's home-farm. It has gone on over a long term of years, and it is not possible now to find out exactly how all the consolidation in each village was effected, but though no doubt much of it was by fair means, undoubtedly some has been by high-handed methods and by such procedure as obtaining the surrender of a tenant's lands by involving him in debt. The result unfortunately is that *chakbandi* is too often regarded as a device of the landlord for improving his own position at the expense of his tenants. One revenue officer went so far as to say that *chakbandi* stunk in the nostrils of the tenants, and

until that feeling is overcome, as it can be overcome in time by fair and successful operations, it has to be borne in mind. It was declared in a meeting of the Board of Agriculture held last December, when I was President of the Board that *chakbandi* had made great strides in this tahsil. I find that statement greatly exaggerated. The village which was quoted to me as the best example of what could be achieved is Saragaon. I have not been able to visit it, but I have gone fully through the map and the papers with people who know the village. I find that though the operations have been aided by the fact that 25 tenants own small tanks and were consequently keen to get their land concentrated under the command of those tanks without going too minutely into calculations of the abstract values of the plots exchanged, still there has been consolidation in only 455 acres out of a total village area of 3,651, of which 3,134 acres is occupied and about 2,000 acres under rice. In this village, as in the others which I have examined in the Janjgir tahsil there are legal difficulties which must be removed by legislation before free scope can be given even to the voluntary efforts of cultivators. I shall discuss those difficulties later on. In two of the three villages of the Janjgir tahsil which I examined where there has been partial *chakbandi* by private effort, I found that a good start had been made in remodelling the land. High class rice cultivation implies embankments which should contain areas of a flat surface as large as the lie of the land permits. If, however, holdings are scattered, the embankments have to be sited more according to the limits of the plots in the possession of the different holders than in accordance with the lie of the land. A good lay-out is therefore impossible. In these two villages I found that *chakbandi* had permitted a radical remodelling of the embankments so as to obtain the most advantageous lay-out. In one the work had been chiefly done by the landlord on the home-farm but in the other I found four go-ahead tenants who had spent between Rs. 2,000 to Rs. 3,000 on remodelling, including the building of small tanks on parts of their holdings to irrigate the rest of them.

8. In the Drug district, there are two most interesting villages which teach one a lot about the *chakbandi* problem. They are the villages of Matwari and Risama in the Drug tahsil. In Matwari the unaided efforts of the malguzars and the tenants have effected *chakbandi* completely in the sense that everybody's land has come into the scheme, but if there had been legal sanction and Government help behind the operations, the consolidation might have been more thorough. The following considerations go against the argument that the success achieved in this village proves that general success can be obtained without Government help and legislation. The village is a small one of 827 acres and is almost all of one kind of soil and that poor. There has, therefore, been little trouble about forming *khars*. The tenants all live on the spot or in neighbouring villages and there happened to be no quarrels among them. The landlords are progressive men who live in the neighbouring village of Risama, and in Matwari their home-farm covers 213.27 acres. As a result of *chakbandi* the number of fields, which was 2,934 when the village was last numbered and had since, mainly by family sub-division, risen to 3,651 has been reduced to 243, and the latter number would have been still smaller, had not legal difficulties prevented the lumping together under one number of some portion of the home-farm which though now contiguous are held under different rights, some being *sir* and some *khudkasht*. As the number of cultivators is 39, the average number of fields per cultivator has fallen from 98 to 8, but both the total figures include all patches of communal land, water-channels, roads, etc., and unoccupied land, hence the present number of plots per cultivator is less than eight. The numbers 3,651 and 98 are probably both somewhat exaggerated, as the village has not been properly renumbered for a long time and a skilful renumbering in its unconsolidated state would have reduced both these figures somewhat. Still the contrast is striking. The simplification of the map and of the settlement and annual land record papers is thus obvious. The work of preparing these papers will in future not be one-tenth of what it was before. I found all the people very content with the new arrangements and had not the slightest intention of going back on them. The work of remodelling the fields by levelling superfluous embankments and reconstructing others so as to take the best advantage of the lie of the land has begun but it requires money and time and has not yet been carried through, but what I saw showed me that the possibility which *chakbandi* gives of preparing a really good lay-out of the land is one of its greatest advantages.

9. In Risama next door, which belongs to the same landlords and in which there is much home-farm, I found a very different state of affairs. Consolidation has been almost entirely in the home-farm, and for reasons which I could not get at the bottom fully during my short visit to the village but which were no doubt based on the

landlords doing their best for themselves irrespective of the rights and convenience of the tenants, the feeling against the landlords was very strong. From the purely agricultural point of view, however, the landlords have done excellent work for themselves. One large block of 242 acres has all been converted into home-farm. The landlords have taken the advice of the Executive Engineer for irrigation and borrowed the services of a sub-overseer who took the exact levels of the land. The fields were then remodelled according to the levels and reduced in number from somewhere about 100 to 19. In one part of the village some old small scattered rice fields and some adjoining waste lands had all been consolidated into one large rice field properly embanked of 25 acres, by far the largest rice field which I have ever seen. The work of remodelling was still going on, but landlords said that up to date they had spent Rs. 32,000 on improvement in both villages. This village also illustrated the legal difficulties which impede progress and which I shall now discuss.

10. While I consider that progress in the past would have been considerable, had a more persistent effort been made to overcome the difficulties of the problem, I am fully conscious of those difficulties. They are both general and legal. The general difficulties are—

(1) The people are intensely conservative and have a low standard of comfort.

(2) For many reasons, one of which is that the rice crop, while it gives some concentrated work during the operations of cultivation and at the time of harvest, leaves the people with nothing to do for a large portion of the year, they are a great deal lazier than the people of the cotton tracts and considerably more lazy than the people of wheat tracts. Though this note gives indications of unaided progress, the mountain of inertia that has to be faced cannot be ignored.

(3) As already explained, there is a feeling that *chakbandi* is for the benefit of the rich man, usually the landlord, and to the detriment of the poor man.

(4) Having few intelligent interests, the people are prone to useless squabbling. The volume of civil litigation in the Janjgir tahsil, where voluntary progress has been greatest, was recently quoted to me as due to the absence of intelligent interests among the people.

(5) The landlords contain few men who are leaders of the people, such as are found in large numbers in, for example, the Narsinghpur district. Relations between the tenants and the rent-receivers who are the landlords are often very strained.

(6) There are many *Satnamis* (reformed *Chamars* or leather-workers) among the people, whose efforts towards social uplift are taking the form of opposition to the Hindu castes. The existence of this large sect in the tenantry embitters relations among them and between the tenantry and the landlord. *Chakbandi* operations tactlessly conducted could very easily provoke a riot.

11. The legal obstacles can be summed up in one sentence, that the law at present does not provide for the cultivators obtaining clear and undisputed rights in the land they receive in exchange in the process of consolidation. The Land Revenue and the Tenancy Acts make some provisions for transferring rights in the land when exchanges are made, but those provisions are not full enough. It was suggested when the present Tenancy Act of 1920 was under consideration that it should provide more fully for exchanges, but in the end, as exchanges affect more than tenancy land, it was decided that the provisions in the first draft bill should be cut out as inappropriate in a bill regulating the relations between landlord and tenant. Section 2, sub-section (17), of the Land Revenue Act provides that where by any local custom land is liable to exchange or redistribution among the cultivators, land which is not *sir* land (home-farm in which no tenant rights can accrue) and which is taken in exchange for *sir* land, shall become *sir* land, and the *sir* land given in exchange for that land shall cease to be *sir* land. Rules under section 68 (2) provide that any land previously held by a *malik-makbuza* (plot proprietor) or tenant which comes into the possession of a proprietor in exchange for *sir* land may be recorded as *sir* land by the Settlement Officer, if he is satisfied that the two plots are of approximately the same value and the exchange is voluntary. They also provide that the Settlement Officer may declare to be *sir* any *khudkasht* land (temporary home-farm) received by any proprietor from another proprietor in the same *mahal* in exchange for *sir* land of approximately the same value. In both cases the *sir* land given in exchange is recorded in the right in

which the land taken in exchange was previously recorded. I have been informed that the word "exchange" here is capable of a broader meaning than that assigned to it in section 118 of the Transfer of Property Act, and may fairly be taken to include the interchange of *sir* and *khudkasht* rights in the land of one proprietor when in the interests of consolidation it is advisable to collect all the permanent home-farm into one block. Section 91 of the Tenancy Act provides that when a tenant holding land situate in a village in which the holdings of tenants are by custom liable to periodical redistribution and exchanging such land in accordance with such custom for other land situate in the same village shall be deemed to have the same right therein as he had in his former land, and section 92 provides for a tenant who ceases to hold any land and thereupon commences to hold other land of the same landlord, under circumstances from which it may be inferred that the tenant has accepted such other land in lieu of, or on the same conditions as the land which he has ceased to hold, shall be deemed to have the same rights as he had in his former land.

12. These provisions of the law by no means solve the legal difficulties of *chakbandi*. Land in a Chhattisgarh village consists of some or all of the following kinds:—

(1) *Sir* (permanent home-farm).

(2) *Khudkasht* (temporary home-farm in which any person who is allowed to cultivate it acquires under the law occupancy rights).

(3) *Malik-makbuza* plots (plots of land belonging in proprietary right to persons who are other than the proprietors of the village).

(4) *Milkiyat-sarkar* plots (plots of land of which the proprietor is the Government).

(5) Absolute occupancy holdings (tenants' holdings which carry a right of transfer).

(6) Occupancy holdings (land held in the commonest form of tenant right which does not carry a right of transfer).

(7) Village service land, *i.e.*, land held by village servants as remuneration of their work.

(8) Communal land (land set apart for purposes of the community). Much of this land, such as the village site and the burial ground would not be affected by any scheme of redistribution, but other plots, such as land set apart as standing ground for the cattle or as the place for skinning dead animals should come into the general scheme.

(9) Unoccupied land. This may be either cultivable or uncultivable. The former should come into the redistribution scheme and the latter out of necessity stands out.

(10) Land occupied by railways, main roads and Government irrigation channels.

It is essential that the law should provide for the free transfer of existing rights, including encumbrances, whatever they may be, which the scheme of consolidation necessitates. In addition to direct rights between landlord and tenant there are rights of reversioners which could be legally enforced to the undoing of attempts at consolidation, if it is not regularised by legislation. In one of the villages which I visited I found a tenant being threatened with a suit by his landlord for ejectment for illegal transfer of his land, the transfer being contemplated in a process of consolidation. As the law stands at present, the civil court would have no option but to find in favour of the plaintiff in this suit, and an heir or reversioner might similarly sue. At present, even when all the people concerned are completely satisfied with the transfers effected in consolidation, there is the grave objection that the land record staff has no authority to bring the land records into accordance with the new facts, and in some of the villages I visited I found that the only objection in which the people had to consolidation was that, having accomplished it, they had not the protection which is given to them by an authoritative Government record of their rights. Legislation is, therefore, necessary to secure the people in their rights, even if the consolidation is voluntary, whether it is done by their own efforts or with the help of a Government agency.

13. Legislation is all the more necessary to compel an obstructive minority to fall in with the wishes of the majority. The Act passed in Baroda in 1920 provides for consolidation when two-thirds of the total number of holders in a village who own not ess than half of the total cultivable land in it agree to consolidation. I have no infor-

tion how this provision has worked in Baroda, but in the Central Provinces we have in a way a parallel in the provision of the Canal Management Act of 1919, which provides that if the occupiers of four-fifths of an irrigated area desire to enter into an agreement for the supply of irrigation water, their will can be made binding on the remaining one-fifth. To adopt the Baroda rule in Chhattisgarh would be to ask for failure, as the proportion of the village to be held by the advocates of consolidation is too small, but I think that there should be a provision for a two-thirds majority prevailing over the minority, provided that that majority applies both to the cultivators and to the area held by them. A four-fifths majority would often be useless, especially as applied to the cultivable area, as one landlord with his holding already consolidated could successfully stand out against the wishes of all his tenantry, provided he held personally more than one-fifth of the area. I do not recommend this provision of compulsion as an instrument to be applied at once, but it should be in the law to allow for the increasing demand for consolidation which will doubtless come when operations are successfully carried through in some villages. A provision of the law allowing the officer-in-charge to decline to undertake consolidation if he thinks there are likely to be disputes and difficulties in carrying the operation through would prevent this section from causing trouble.

14. I shall indicate the provisions of law which, apart from substantive law, are necessary to regulate *chakbandi* procedure, by describing the procedure which I consider advisable in the field. There is unanimity of opinion among people who have thought about the subject that it is useless to expect the ordinary revenue staff to achieve substantial results. Past experience shows that they cannot do so. Apart from the volume of their work, which I consider sufficient but not excessive, their other duties prevent the concentrated attention which is necessary for success in consolidation. I therefore propose that there should be a special staff. To begin with I would start early next cold weather with one carefully selected Extra-Assistant Commissioner and give him a staff of five revenue inspectors. The Extra-Assistant Commissioner, who might be called the *chakbandi* officer, requires a reader on the ordinary lower division scale of clerks' pay and two peons. Each of the revenue inspectors requires one chainman. If *chakbandi* is going to spread this staff is obviously insufficient, but it is quite enough for a start, as practical experience will teach us much as we go along and to attempt more at the beginning would be to spread mistakes which would be avoided if a start is made on a small scale and experience is gradually built up before an extended effort is attempted. It is impossible at this stage to indicate what staff may be ultimately required, but I hope that success will compel the employment of a large staff. The *chakbandi* officer should be allowed to select his villages himself. The careful selection of suitable villages to make a start on is very important. They should be villages where everybody is anxious for consolidation, where the landlords are enlightened people and where there are no faction fights. They should be of moderate size and should not present too many difficulties of soils. They should be scattered over the Division so that each may serve, so to speak, as a demonstration centre from which *chakbandi* may spread. I found, for example, in Matwari that the people of surrounding villages were going to it and enquiring how the *chakbandi* there had been accomplished, as they would like to see it carried out in their own villages. The villages should be in or near areas commanded by Government irrigation works, either completed or under construction. I would start off with two in the Mahanadi area, two in the Tendula area and one in the Janjgir tahsil, either in or near to the area which will be commanded by the new Kharung project. Having selected his villages, the *chakbandi* officer should then decide how exactly he is going to proceed to suit the particular circumstances of each village. I give it as a general principle that a scheme of consolidation which is not theoretically perfect but to which everybody agrees is far better than one which, when worked out on paper, is the best that could be devised but which goes against the wishes of the people. The Baroda Act provides for the consolidation of holdings and then for giving out the new holdings by lot. I prefer to work on what I call the nucleus principle. It will usually be found that each tenant has some land which, on account either of its size or of its qualities, he specially prizes. The new consolidated holdings should be built up round these nuclei of land. Mr. Chhotelal told me that he adopted this method of work in 1905 and it promised success. It is the method which the people have adopted themselves. To carry it out requires more skill and patience than other methods, but it ensures contentment. To use the common parlance, it is better to have 14 annas consolidation and everybody content than 16 annas consolidation according to theoretical ideas of what is best and most people dissatisfied. Though the law

should not bar money payments between tenants to adjust inequalities of exchanges, they should be avoided so far as possible, as they will lead to elaborate and unsatisfactory valuations of land, whereas experience shows that the people are ready to yield something in abstract value for the sake of the convenience which a consolidated holding gives. When the consolidation officer has started the operations in each village, he can then leave the details for the time being to be carried on by the revenue inspector, who must of course be a specially selected man fitted by temperament to the work. He will travel round his villages and constantly check what the inspectors are doing and then go through the whole scheme when the work is finished in each village. The revenue inspector will come in again when the scheme has been approved and prepare the new map according to the consolidation and a new record of right, which should be checked and passed by the *chakbandi* officer. There should be a provision in the law for giving possession of the consolidated holdings by warrant. In discussing the problem with me, Mr. Chhotelal emphasised the necessity of not insisting on too early concrete results. A little patience at the beginning, resulting in a few villages well done and everybody content, will be much more satisfactory than telling the *chakbandi* officer that he must produce so much work per season.

15. Chapter IV of the Land Revenue Act provides an elaborate scheme of appeal, revision and review in all revenue matters. It is obvious that if a man has a right of two appeals, and sometimes three, in every petty revenue matter, he cannot have a more limited right in the most important matter of the taking away of some of his land and the handing over to him of other land. It is equally obvious that if appeals do occur at every turn, *chakbandi* operations will be a failure. While we cannot bar the right of appeal, we must minimise the chance of it by the careful selection of villages and careful work. The *chakbandi* officer must have a full right, for reasons to be recorded in writing, to reject any application for his help. It is quite probable that some applications will be made to him by one faction in the village simply to annoy the other. In other words, an attempt will be made to use him as a tool in faction fights. The sad history of the cases for the partition of villages is sufficient warning of how work, meant to further the smoother running of village economy, may be used as a weapon for bitter quarrels. Though I suggest that the law should contain a provision about compulsion, I would not use compulsion until experience has made us expert in the work. The *chakbandi* officer should work in each village with a panchayat consisting of himself, one representative of the landlords and three of the tenants. He should select these men himself, so as to ensure his obtaining men who will really help and who represent the different interests in the village. In particular the small tenantry should be represented. My experience is that a small man who has lived all his life in the village and has no interest outside it may have a very wide knowledge of the capacities of the land in the village and be a much more useful member of the panchayat than a man of more substance and education. When the *chakbandi* officer is visiting his other villages the revenue inspector should act as his deputy on the panchayat.

16. The question of determining under whom the *chakbandi* officer should work is important. I suggest that he should be under the Settlement Officer and the Settlement Commissioner. The Settlement Officer cannot do the work of consolidation himself, as his ordinary duties compel him to work against time on a carefully thought-out programme, but he has a familiarity in dealing with soils and maps which makes him more competent to scrutinise *chakbandi* proposals satisfactorily than a Deputy Commissioner without settlement experience. There is the difficulty, however, that a Settlement Officer is not always in the district. One will however be working in the Raipur *khalsa* area from next November, one in Bilaspur from November 1927 and one in Drug from November 1928. To get over this difficulty I would provide in the law for the proceedings being submitted to the Deputy Commissioner with a provision, as is already the practice in respect of some of the Deputy Commissioner's powers when a settlement is in progress, for the Deputy Commissioner's power being transferred to the Settlement Officer either of the district in which the village is situate or of an adjoining district. In time, when the work is stereotyped, the Deputy Commissioners may be able to assume the duties which I would now assign to the Settlement Officer. The Settlement Commissioner is better fitted by training than the Commissioner of the Division to control the work, unless of course the Commissioner has wide settlement experience, and if, as is possible, *chakbandi* spreads to the other Divisions of the Province, where the problem exists but is a great deal less pressing, his control will give the advantage of consistency. He should of course keep in touch with the

Commissioner of the Division. The transfer of the ordinary powers of the Commissioner under the revenue law to the Settlement Commissioner is a regular feature of revenue work. Nowadays too the ordinary executive duties of the Commissioner in connection with the management of town land are transferred, during the progress of a town settlement, to the Settlement Commissioner. The procedure, as authorised both by the law and by executive instructions, has worked quite smoothly, especially as it is laid down that the Settlement Commissioner, when acting under executive instructions, should not go against the wishes of the Commissioner without a reference to the Local Government. A further practical reason for putting the Settlement Commissioner in control is that for the next good many years much of his work will lie in Chhattisgarh and he should be able to do his *chakbandi* work on or near the spot. I propose that instead of the usual procedure of allowing appeals and as a more effective substitute for it, the *chakbandi* officer should submit his proposals to the Settlement Officer for confirmation, with a statement, if any, of objections which he has not been able to remove. The Settlement Officer should send them on to the Settlement Commissioner only if he fails to effect complete agreement. It is not necessary for the Local Government to see the papers unless special application is made to it under circumstances similar to those under which a third appeal is allowed in ordinary revenue cases to the Local Government. My experience in dealing with partition cases strengthens my belief that the ordinary process of appeal would be fatal to consolidation operations. I have not yet met a member of the bar who has the familiarity with maps and village papers which renders him any help in a partition case. I do not blame the bar for this lack of knowledge. They have little opportunity of acquiring it, but I have had a pleader before me who, when examining the map of a village in which he was prosecuting a partition appeal, did not know the difference between a main Government irrigation channel and a village road. Appeals drafted by pleaders and presented in the ordinary way would simply confuse the issues, but each officer who had to send a consolidation case to his immediate superior should receive all objections and should analyse them before submitting the case for orders.

7. The opportunity of consolidation operations can be taken to effect other improvements in the villages besides mere consolidation. The straightening out of village roads and the provision of new roads so as to give access to all holdings and to tanks, grazing ground, etc., should be looked to, and where proper facilities do not now exist, adequate provision for communal purposes, such as the standing ground for cattle, the burial ground, etc., should be made. It should also be possible by agreement to provide for essential private watercourses between holdings.

18. When the scheme of consolidation is completely worked out, there should be an entirely new record of right. The new map will bear no resemblance to the old one and the village papers will be reduced in bulk to a fraction of what they were before. It is not enough simply to prepare fresh annual papers, as the village papers must be given the higher evidential value which belongs to a record of right. As, however, under the procedure I suggest, consolidation will have been done by mutual agreement and, if not based on complete agreement, will have been scrutinised by superior officers, there should be no provision corresponding to that in section 80, sub-section (1), of the Land Revenue Act, which provides for the institution of a civil suit for the cancellation or amendment of any entry within one year of a settlement. Such a provision would moreover be illogical, as the new rights in the village will be based entirely on the *Chakbandi* Act and not on previously existing rights, facts or customs.

19. The law should also provide for cultivators submitting for the approval of the *chakbandi* officer and his superiors their unaided efforts at consolidation, either complete or partial. When the results of this private consolidation have been approved, the *chakbandi* officer should have power to prepare a fresh record of right for the village or portion of the village affected, so that the cultivators may have the protection of the law.

20. There are very few ryotwari villages in Chhattisgarh but they should not be left out of the scheme of consolidation, especially as the most important one in the whole Division is Baloda Bazar, a tahsil headquarters and commanded by the Mahanadi canal. This village was previously malguzari, but the malguzar's rights were bought out when the Baloda Bazar tahsil was established. Its holdings are not very scattered but are much less compact than if the village had been ryotwari all along. Near it there are two small ryotwari villages, also both commanded by Government irrigation. There is some scope of consolidation in them. I have talked to the Tahsildar, Baloda Bazar, and to the *patels* of all the three villages and they are hopeful that consolidation can be carried out.

21. As is clear from this note, *chakbandi*, to confer full benefit, has usually to be supplemented by the remodelling of holdings. Remodelling costs money, and the Government should make it known that it will be prepared to give land improvement loans freely to people who want to remodel their land after consolidation. While it is quite proper that these loans should be given out on the recommendation of the *chakbandi* officer, they should be part and parcel of the ordinary work of administering land improvement loans. The loan account is one which can easily get into confusion, unless it is carefully administered, and all improvement loans, for whatever purpose granted, should be on the Tahsildar's books and he should be responsible for the collection of the principal and interest. I would allow no concession in the rate of interest, as different rates of interest mean a great complication in the accounts, but I would show leniency in fixing the instalments of repayment. This is no departure from established principle as it has already been recognised that the instalments of land improvement loans should vary according to the work for which they are taken.

22. Suggestions have been made from time to time that consolidation would be encouraged if the Government declared that the land revenue would be lowered or at least not enhanced at settlement in villages where it had been carried out. Stated in this crude form, the proposition goes much too far, but every effort should be made to avoid the suspicion that the land revenue has been increased because of consolidation. The general procedure about not assessing improvements should be followed. By keeping an old unconsolidated map of the village showing soils and positions, it is a simple matter to avoid enhancement on account of the improvements due to consolidation.

23. The Registrar of Co-operative Societies, speaking in the Board of Agriculture last December, gave little hope of co-operative societies in Chhattisgarh being able to help effectively in consolidation. I have therefore ignored them so far in this note, but a village where a healthy co-operative society has taught the people to work together should offer a promising field for consolidation, and the possibility of forming societies for financing remodelling after consolidation should be borne in mind.

24. This note does not pretend to be exhaustive. It merely embodies the ideas which I have formed since I went to Chhattisgarh as Commissioner in January. I propose now that it be discussed during the monsoon by a committee in Raipur, presided over by the Hon'ble the Revenue Member. The other official members should be the Commissioner of the Division, the Settlement Commissioner, the Legal Remembrancer and Mr. Chhotelal, Extra-Assistant Commissioner. As non-official members I would have all the Chhattisgarh members of the Legislative Council, rural and urban. It is advisable to have the urban members also so as to get all the elected representatives interested in this very important problem. To the strictly Chhattisgarh members I would add Sir S. M. Chitnavis, who represents the Nagpur and Chhattisgarh landholders and is himself a large landholder. I would add also two cultivators from each district to be nominated by the Local Government, who should be men with practical experience in consolidation. When the general principles and procedure have been thrashed out, work should be started in November, as suggested above, and the necessary bill prepared for presentation early in the new Legislative Council to be elected at the end of the year. If the legislation is passed in time for the second season's work, it would be quite early enough.

Oral Evidence

29094. *The Chairman*: Mr. Chhotelal, you are an Extra-Assistant Commissioner?—Yes.

29095. I understand you have been in charge of the scheme for consolidation?—Yes.

29096. In what district?—The whole Division, that is, Raipur, Bilaspur and Drug.

29097. Mr. Burton, I understand that it is agreeable to you that you should sit at the table and that you are willing to answer any questions that the Commission may put to you?—Yes, to the best of my ability.

29098. (*To Mr. Chhotelal*): I propose to ask you some questions first. Have you seen this document which has been placed before the Commission and is entitled 'Note on the Consolidation of Holdings in Chhattisgarh'?—Yes, I have seen it.

29099. Who drafted this note?—Mr. Dyer, Commissioner of the Chhattisgarh Division.

29100. Yes, I see that he has signed it in the capacity of Officiating Commissioner, Chhattisgarh Division. He points out that in 1905 Mr. H. M. Laurie, who was then the Commissioner, Chhattisgarh Division, attempted consolidation, and initiated a scheme which was discontinued in 1907 by the orders of the Local Government without any reason being assigned. Do you know in fact why the Local Government ordered the discontinuance of that scheme?—No.

29101. Then again in 1912 the Local Government itself took the initiative impressed, so this document says, by the success of certain experiments which had been attempted in Austria, but very little came of that scheme, is that so?—Yes.

29102. Now, when did the scheme that you are most familiar with come into being?—About a month ago.

29103. Nothing has been done in this direction since 1912; this scheme was started only a month ago: is that so?—The note was drafted last year, the conference was held in August, and then it was discussed whether there should be legislation or not. Then, in the month of November, I was ordered to start work and I started in December.

29104. Is it within your knowledge how long after 1912 the effort was persisted in?—(*Mr. Burton*) I was here at the time as Assistant Commissioner for a year; it went on for another year after that, so far as I am aware.

29105. It went on till the beginning of the War?—(*Mr. Burton*) Yes, it wa interrupted by the War.

29106. You have read through this document?—(*Mr. Chhotelal*) Yes.

29107. And you agree with it?—(*Mr. Chhotelal*) Yes, I quite agree with it.

29108. I do not know whether you wish to say anything, Mr. Burton?—(*Mr. Burton*) I agree, generally. It was drafted after considerable enquiry by Mr. Dyer, who was particularly interested in the matter, as Settlement Commissioner, and I think he has put together practically everything that has been done in these few pages. It was discussed by a conference held by Mr. Dyer in August, it was submitted to Government, and practically the whole of it was accepted by both the official and non-official opinion in the conference.

29109. It has been named *chakbandi* in this Province?—(*Mr. Burton*) Yes.

29110. In addition to these two successes that have been achieved in the Drug district, there have been two other villages where the experiment has been successful?—(*Mr. Burton*) That is in the next district; there it was done by a malguzar practically.

29111. That is not part of the 1912 scheme, nor the fruit of it?—(*Mr. Burton*) No.

29112. Mr. Dyer sets down ten different types of ownership or tenancy, and points out that in this multiplicity of systems lies the real obstacle to consolidation?—(*Mr. Chhotelal*) Yes.

29113. And he concludes from that that legislation, securing the people in their rights in their new holdings, is a *sine qua non* for an important spread of this movement?—(Mr. Chhotalal) Yes.

29114. I see that Mr. Dyer thinks that a two-thirds majority should prevail over the minority; do you agree with that?—(*Mr. Chhotelal*) Yes. (*Mr. Burton*) I think I should insist on rather a larger percentage than two-thirds.

29115. I was surprised to see, in the face of Mr. Dyer's remark on page 157 of the note, that a two-thirds majority should prevail, that he holds the view that the complicated system of appeal at present obtaining should, to some extent, be waived, because consolidation will have been achieved by mutual agreement and if not based on complete agreement, will have been scrutinized by superior officers, and that in adjusting the new record of right, there should be no provision corresponding

to that in section 82, sub-section (1) of the Land Revenue Act. Could it be said that a scheme which had been put into effect, in spite of the opposition of one-third of the owners, was a scheme which, in fact, had been achieved by mutual agreement?—(*Mr. Chhotelal*) Yes. The fact is that the work will be done by arbitration by the panchayat, and, when the representatives of the malguzar and the tenants have agreed to the *chakbandi*, the proceedings will be submitted for confirmation to the higher authorities, and the man who has any objection can very well object to the superior of the *chakbandi* officer. (*Mr. Burton*) For the peace and welfare of the village, I think it is desirable that a larger percentage should actually agree; the actual transfer would only affect the man whose field is to be altered.

29116. Would you be prepared to suggest the removal of the right of appeal?—(*Mr. Burton*) I think it is essential, if the work is ever to be completed in reasonable time.

29117. Mr. Dyer gives the staff which will be required. What staff is at present engaged on the work?—(*Mr. Chhotelal*) I have three Revenue Inspectors only.

29118. He suggests an Extra-Assistant Commissioner, who might be called the *Chakbandi* Officer, with a staff of five Revenue Inspectors, each with one chainman, and a reader on the ordinary lower division scale of clerks' pay and two peons for the Extra-Assistant Commissioner. Could important schemes be undertaken with a staff of that size?—(*Mr. Chhotelal*) No; that is only to start with; experimentally, I have taken only a small staff.

29119. Are you finding that there is a demand on the part of cultivators for consolidation?—(*Mr. Chhotelal*) Yes, there is a large demand.

29120. Is it a growing demand?—(*Mr. Chhotelal*) Yes. Of course, in every village the people are doing it more or less of their own accord, but all the tenants do not do it.

29121. How much propaganda has there been to popularise the idea? Has there been any propaganda?—(*Mr. Chhotelal*) There has been no propaganda.

29122. What about the attitude of the average malguzar; is he favourable to the idea?—(*Mr. Burton*) I think one can say safely that he is the keenest really; one of the troubles is that the people suspect that the malguzar, with his influence, gets the best of the land.

29123. I see that attention has been drawn to the possibility of applying this scheme to the few ryotwari villages in Chhattisgarh; has anything been done in that connection?—(*Mr. Burton*) I have just had that examined for Baloda Bazaar village, and Mr. Chhotelal thinks that it is a favourable case. They have a complete irrigation system, and it is hoped to introduce the *chakbandi* system without any difficulty at all, and then apply the watercourse system of irrigation, to have a complete model.

29124. Who is going to make the watercourses?—(*Mr. Burton*) As matters are at present, I should rather propose that Government should give a ryotwari village, an improvement grant for the purpose, just as grants are given for wells in out-of-the-way villages.

29125. Would that be administered by the panchayat?—(*Mr Burton*) No, it would be done by the Irrigation Department. The grant would be given by Government.

29126. And handled by the Irrigation Department?—(*Mr. Burton*) Yes.

29127. The Irrigation Department staff would actually make the minor watercourses?—(*Mr. Burton*) They would design them, and supervise the construction.

29128. But the usual thing in this Province, as elsewhere, is to leave the small watercourses to the villagers themselves?—(*Mr. Burton*) Practically none, as far as I remember, have been made. I may perhaps add that once Government gave loans for the construction of minor watercourses; recently I made enquiries about it and I found they had been fully constructed but had fallen into disuse and were being broken up again.

29129. Can either of you throw any light on paragraph 23, page 160, in which we are told that:

"The Registrar of Co-operative Societies, speaking in the Board of Agriculture last December, gave little hope of co-operative societies in Chhattisgarh being able to help effectively in consolidation". What argument did he use?—(*Mr. Burton*) I have not seen the papers, but I imagine he felt that they were not sufficiently influential to add much weight to the movement.

29130. He did not regard this as a promising field for the expansion of his department's work?—(*Mr. Burton*) I think they are fully occupied in rectifying their own affairs.

29131. Do you anticipate any difficulty in getting the necessary legislative acts passed into law?—(*Mr. Burton*) I anticipate some difficulty; there will have to be amendments to the existing Revenue and Tenancy Acts.

29132. In order to make it possible to have a new record of rights after consolidation?—(*Mr. Burton*) I think the main difficulty is to transfer from one area to another the same rights that were held in the area originally by the owner

29133. And to attach all the weight of a record of right to the new holding?—(*Mr. Burton*) The right must go with the man who is the holder.

29134. Do you regard it, from your knowledge of these matters, as a feasible proposition, in the face of present conditions, to get this law passed?—(*Mr Burton*) I think we shall have the support of the local members in the Legislative Council.

29135. Would it be a very material contribution to the agricultural prosperity of the districts?—(*Mr. Burton*) There is no doubt about it.

29136. Are there any obstacles which are not suggested in this document or in your evidence that you care to tell us about?—(*Mr. Chhotelal*) No. (*Mr Burton*) The practical obstacle is the tremendous amount of trouble involved in the concentration of holdings so widely spread. The map which is on the wall here shows the position after the first stage in a village Dumartalao; each colour represent a certain man's holding, it would be an enormous task to get them all together.

29137. *Mr. Calvert*: Have you attempted to work out the cost per acre?—(*Mr. Chhotelal*) No. As the work which is going on has been started experimentally, I cannot say what its cost will be when it is done on a large scale. I had a lot of trouble in the beginning to persuade the people first to let me start the work When I started work certain people objected to having it done in the manner in which I was doing it. I explained matters to them, and then they came round and agreed to my proposal. In this way, it took a lot of time. The first village in which I started took a lot of time, but as the work progresses it will take less.

29138. We had a party from this Province which came to the Punjab to see the consolidation work being done there; you were not a member of that party, Mr. Chhotelal?—No; Rao Bahadur Jagannath Prasad was a member of the party.

29139. Do you not think it would help your work if you saw what is being done there?—(*Mr. Chhotelal*): Yes, it would be a great help to us, and we should gain some experience by seeing what is going on there. I have been told, however, that in the Punjab the villages have uniformity of soil. Here, the soil varies from block to block; sometimes it is in patches, and black soil may be found close to murum soil at a very short distance. The people attach importance to the superiority and inferiority of the soil, and they want to hold on to it; they do not want to make exchanges in different kinds of soils.

29140. You will find that passing away in time. How much have you done so far?—(*Mr. Chhotelal*) I have finished one village.

29141. How much time did it take you?—One month.

29142. *Prof. Gangulee*: What is the area of the village?—(*Mr. Chhotelal*) The total area is 1,000 acres, but the occupied area is about 485 acres.

The Chairman: In case you misunderstand Mr. Calvert's mind on the matter, I may tell you that he is astonished at the speed at which you are doing it.

29143. *Mr. Calvert*: For 1,000 acres, we might take anything from 6 months to 2 years for consolidation?—(*Mr. Chhotelal*) Consolidation has been attempted; it is not yet complete.

29144. It is not in one block?—(*Mr. Chhotelal*) No.

29145. You are satisfied by getting a single man's holding down to several blocks Could you not get them all down to one block?—(*Mr. Chhotelal*) It cannot possibly be done if a single man disagrees with it; nobody will agree.

29146. What guarantee have you against the consolidation being upset in case of a dispute subsequent to the completion of the work?—It will not be upset when it is legislated for and when the civil court will have no power to alter the *chakbandi* or the record of rights which I shall prepare.

29147. At present you have no guarantee at all?—No; nothing.

29148. Do you get the persons concerned to sign an agreement of arbitration in cases of dispute?—I am thinking of it; but for the present I am working on the line that everybody should agree to it.

29149. Do you not think it will be safer to get them to agree to refer disputes to an arbitration? Yes; it will be necessary.

29150. Page 156 of the note refers to a case in which a landlord threatens the tenants with a suit for ejectment and so on. "As the law stands at present, the civil court would have no option but to find in favour of the plaintiff". Do I understand that the civil court would not throw out the suit on the ground that it is opposed to public policy?—(*Mr. Burton*) It gives the landlord a right to apply in the event of a illegal transfer; this is under the Tenancy Act.

29151. It is not a general rule of civil courts not to support any claim which is opposed to public policy?—I have not much experience of civil courts; but this is under the Tenancy Act

29152. Would you kindly let me know what is the difficulty about the alteration of the land records referred to at the bottom of the same page of the note: "the land record staff has no authority to bring the land records into accordance with the new facts"?—(*Mr. Chhotelal*) Yes, because the rights are not easily transferable from field to field.

29153. On page 157 it is stated that these villages should be selected in such a manner that "they should be scattered over the Division so that each may serve, so to speak, as a demonstration centre from which *chakbandi* may spread". Is that the policy you are following?—Yes, I am going to follow it later on when I have the trained staff. I am training the staff first of all and finding out an easier method of getting on with the work.

29154. Do you not think it is better to concentrate on one particular neighbourhood?—Yes; I am working in one neighbourhood.

29155. I presume this consolidation once started will continue for 200 or 300 years?—I do not think it will take 200 years.

29156. There are 34,000 villages to-day?—In some cases people may agree to do it by themselves later on.

29157. Is there any proposal to put this work under a Settlemet Officer; has that been the policy now?—Yes; I am working as *Chakbandi* Officer for the present and my proceedings will be submitted to the Settlement Officer for confirmation.

29158. Do not the people regard the Settlement Officer with some suspicion?—I do not think so. I was an Assistant Settlement Superintendent and I started the work under the Settlement Officer and I was hopeful that the work would be successful if I had not been removed from it. I was put on to another work and this work was stopped. But it was not through fear of the Settlement Officer that I could not carry on the scheme.

29159. You do not think the people connect the Settlement Officer with an increase of revenue?—It is not so much the fear of increase of land revenue.

29160. It is linked up with the Settlement Officer's work?—I do not think so.

29161. Then in paragraph 17, page 159, various other improvements are suggested. Is there not a danger of overloading your scheme by too many other improvements?—No; these things will be done in the ordinary course, *i.e.*, the pasture grounds and watercourses; I have nothing to do with them. My consolidation of holdings will automatically bring about these improvements.

29162. You do not think you are making it too difficult?—No.

29163. In the case of a minor owner are you accepting agreement by his guardian?—So far I have not come across a case like that. But when the Act is passed I think it will not be necessary to take the acceptance of anybody for the consolidation of the holdings, that is, when the Settlement Officer has confirmed my proceedings. The question of reversioners is likely to arise but that is a question which should be decided by the civil court and the civil court will be barred from taking cognisance of anything which is against *chakbandi*.

29164. Do you really think that it will be advisable at this early stage to provide for any form of compulsion by any majority at all?—Yes; of course, for the present it is desirable because I shall be getting the work done sooner if I am allowed to work by compulsion.

29165. Who do you think will make the most noise, the 99 people whom you please or the one whom you displease? The one displeased will cry far louder than the 99 whom you please?—Of course there will be a certain amount of protest. But who would hear one man's cry and what can one man do? In a village when 99 persons agree and one disagrees; the village will say that that man is out of his senses and people will not mind it.

29166. *Mr. Kamat*: Just as you are of the definite opinion that consolidation by voluntary consent is rather a precarious thing and uncertain, also a slow process, are you also of the opinion that even by co-operative methods consolidation is equally slow and uncertain?—I do not think that it will be successful by the co-operative method here because the co-operative man has got no knowledge of soil classification, no knowledge of agriculture and no experience of agriculture, and he cannot understand things properly at all while making the adjustment of the areas of the different holdings.

29167. In short, therefore, you rule out the co-operative method and fall back upon legislation?—Yes.

29168. I want to ask you whether according to your experience certain guiding principles are not necessary for consolidation?—Yes; certain guiding principles are necessary.

29169. In the first place, when you consolidate land, is it not necessary to have for your guidance a certain standard unit of acres suitable for each tract; say, 10 acres or 15 acres or even 5 acres according to the nature of the soil and so on, below which you should not have any holding unconsolidated?—Yes.

29170. How are you going to fix this standard unit below which you ought not to go?—This unit cannot be fixed because the holdings vary in size. Certain holdings are of one-tenth of an acre, certain holdings are of 50 or 200 acres. Of course when the tenant has got one field of a large extent there is no need for consolidation; it will stand.

29171. So you are not particularly concerned with the size of the holding?—No particular size is fixed.

29172. The whole thing is arbitrary?—Yes.

29173. Then again, do you not think you ought to lay down another principle when you redistribute your plots? For instance, a neighbour to you who has already got a certain plot may desire a contiguous plot to add to his holding; should he not have the first right, the right of pre-emption so to say?—No; that would be very difficult; it was never the custom and it is not possible.

29174. Supposing there is a strip of land close to my land for which I am prepared to pay any price I should naturally have the first choice; yet according to your system the panchayat or the officer in charge gives that strip of land to somebody else; is that equitable?—Yes; that will be equitable if the panchayat finds out an area of equal value.

29175. I doubt whether that is a sound system and whether, if you have legislation, the Legislative Council will support an idea whereby a single individual officer arbitrarily distributes the strips, not giving the preference to the neighbours who wish to take them up?—That does not depend upon the individual officer. There will be three representatives of the tenants, one representative of the malguzars and the fifth will be the Government officer entrusted with preparing the records.

29176. When you say that two-thirds of the people of the village should prevail over the remaining one-third, do you mean two-thirds of the owners or two-thirds of the cultivators?—Cultivators having in their possession two-thirds of the occupied area.

29177. That is to say two-thirds of the vested interest in the land?—Yes.

29178. Not two-thirds of the number of owners?—No.

29179. Then again if you have consolidation elaborately and systematically carried out, do you not think that people should have greater opportunities to ventilate their grievances; for instance that you should have a higher authority over the consolidation officer in the shape of a tribunal?—Of course there is no objection to having a tribunal or a court over the *Chakbandi* Officer; but the thing is this: if one man appeals and his holding is changed by the appellate court then the whole *chakbandi* will have to be upset.

29180. My colleague, Mr. Calvert, has drawn your attention to the fact that, if things are left to the Settlement Officer, probably the people will not be satisfied or the judgment of one single man may not be able to satisfy all. Do you not therefore think it is necessary to have a tribunal constituted so that any man may have an opportunity to place all his grievances before it?—Of course, it is necessary.

29181. Are you conversant with Town Planning Acts?—No; I am not.

29182. Do you know the principles of town planning and the redistribution of residential plots at various stages, the opportunities given to the people concerned, in the shape of notifications by the Government, that a particular scheme is framed. A particular scheme would be framed, a draft map of the distribution made, and complaints invited at different stages from the people concerned, so as to give the people an opportunity of claiming particular plots. Would you have an elaborate system of that sort so that every tenant could put his proposals before the consolidation officer?—Yes, every tenant should have the opportunity.

29183. And, supposing after redistribution of all the different plots, an undesirable uneconomical fragmented plot remained on hand, could there be a procedure by which its money value would be fixed either by the consolidation officer or by a panchayat and that money value paid to the owner of that small plot?—No, that will not be possible at least for the next forty or fifty years.

29184. But if there were a plot which was too small to be tacked on to any of the other holdings, it would be desirable to value it in money, and either to distribute that money among the different shares or to give it to one man; do you not like that idea?—No; the people here are very conservative and they do not like to part with a field; whatever sum is paid, the owner will not be satisfied.

29185. But otherwise, according to your own ideas, that little plot would remain a more or less uneconomic plot?—It may be, but I would allow it to stand over, in order to make my *chakbandi* operations more popular.

29186. *Dr. Hyder*: In the Chhattisgarh Division, are the plots of the landlords or malguzars also scattered about?—Yes.

29187. The *sir* and *khudkasht* plots?—Yes.

29188. It appears to me that according to the different sections of the Tenancy Act and the Land Revenue Act the law is on the side of consolidation?—Yes.

29189. So that there should be no difficulty?—No, but the law is not sufficiently strong and clear to effect a general *chakbandi*. In particular cases of exchange between two tenants, when they want to exchange a field, they do so with the permission of the landlord; but if the malguzar objects to the exchange proposed between the two tenants, it cannot be done.

29190. In the Chhattisgarh Division, have you this system of redistributing land at certain intervals ?—Before 1882 there was a general custom of redistribution; that was the *lakhabhata* system.

29191. Is that *lakhabhata* system now obsolete ?—Entirely obsolete; since 1882 no village has been redistributed.

29192. With how many rights would you have to reckon: would you have to reckon with the *sir* right, the *khudkasht* right, the *malik-makbuza* right, the right of absolute occupancy, and the right of limited occupancy ?—Yes.

29193. Those other matters which are mentioned in Mr. Dyer's memorandum are not very important ?—No.

29194.—You could deal with the *sarkar* as you liked ?—Yes.

29195. You could deal with the communal lands; they would not give you much trouble; you are not going to consolidate them ?—No, but sometimes the people want a small part of the communal land to be included in their holdings and to give in exchange part of their holdings for communal land.

29196. Do you mean to say they do not have a communal burial or burning ground here ?—No, by communal land I mean pasture land. Certain land is reserved for burial ground.

29197. There would be no difficulty in regard to that ?—No.

29198. It seems to me there would be only four rights with which you would have to reckon: *sir*, *khudkasht* and the two kinds of tenancy rights ?—Yes, and *malik-makbuza*.

29199. Have you in your villages large areas of service land ?—A very small area.

29200. Allotted to the village headman ?—Not the headman, but to the village servant: the village watchman.

29201. *The Chairman*: On page 159 of the note it is said that the Land Revenue Act provides for the institution of a civil suit for the cancellation or amendment of any entry within one year of a settlement. Does an appeal lie from a first decision in that case ?—Yes, an appeal against the decision of the civil court.

(The witnesses withdrew.)

The Commission then adjourned till 2-30 p.m. on Thursday, the 20th January, 1927, at Nagpur.

Thursday, January 20th, 1927.

NAGPUR.

PRESENT :

The MARQUESS OF LINLITHGOW, D.L (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
RAJA SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. C. U. WILLS, I.C.S.
Sir SHANKAR MADHO CHITNAVIS, Kt., I.S.O. } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries.*)

Mr. C. M. TRIVEDI, I.C.S., Registrar, Co-operative Societies, Central Provinces and Berar.

Replies to the Questionnaire.

QUESTION 22.—CO-OPERATION.—(*a*) (i) I am of opinion that Government should take the following steps to encourage the growth of the co-operative movement in this Province :—

(1) Besides the Registrar, the superior staff of the department consists of one Senior Deputy Registrar of the rank of Deputy Commissioner, one Junior Deputy Registrar of the rank of Assistant Commissioner and three Circle Officers on a special cadre on Rs. 250—25—600. The Province has been divided into four Circles, each of which is in charge of a Junior Deputy Registrar or a Circle Officer. The number of Central Banks, registered primary societies and societies under liquidation is as under :—

	Banks.	Societies.	Societies under liquidation.
Circle Officer I ...	8	1,121	132
Junior Deputy Registrar ...	13	788	50
Circle Officer III ...	9	1,112	163
Do. IV ...	7	1,143	190

The Junior Deputy Registrar is in charge of Berar, in which Division the volume of business of banks and societies is greater than in the whole of the Central Provinces and in which future development is likely to occur both in respect of credit and non-credit co-operation, and it is not possible to allot him more banks and societies. The Circle Officers in the Central Provinces cannot efficiently supervise the banks and societies in their circles, particularly as the movement is not in a flourishing condition in the Central Provinces and the reorganisation of societies now in hand makes it incumbent on them to devote more attention to the affairs of societies than in the past. It is not possible to place the Senior Deputy Registrar in charge of a circle as a permanent measure, though in order to give much needed relief to Circle Officers in the Central Provinces, I have placed him temporarily in charge of three banks and about 500 societies. It is therefore desirable to increase the number of

circles from four to five. There is already a sanctioned post of a Junior Deputy Registrar of the rank of Extra-Assistant Commissioner, but the Legislative Council cut out the provision for the post in 1922, and since then no budget provision has been made for this post.

(2) A characteristic feature of the Central Provinces system is that the important duties of education and supervision of primary societies are entrusted to Central Banks. All co-operators are agreed in thinking that the deterioration of the movement in the Central Provinces is largely due to the fact that Central Banks have not been able to perform these duties adequately. It was expected when the movement was initiated in the Province that ultimately the banks would be managed entirely by rural directors from members of societies. For various reasons, however, the control remained with the urban directors who were not in a position to keep themselves in touch with rural conditions. They concentrated their attention on the financing of societies, and so long as collections were good did not trouble themselves about the education of members in the principles of co-operation. Further, it must be recognised that the urban directors are generally busy professional gentlemen who cannot be expected to pay constant visits to distant villages in the mofussil and to supervise and instruct societies. This important work has therefore tended to fall in the hands of the banks' paid staff which is often inefficient if not insufficient, ill-trained and ill-equipped for the task, though it may be mentioned that for the last two years efforts are being made to train them by holding training classes in the rains for about three weeks. In the Central Provinces, a Co-operative Institute has been organised for the Jubbulpore and Nerbudda Divisions. Twelve Central Banks together with their affiliated societies out of fourteen Central Banks are members of the Institute. The Institute is financed by contributions from banks and societies at 3 annas and 1 anna per Rs. 100 of their working capital and by a grant of Rs. 3,000 from Government. Its aim briefly is to develop the co-operative movement and to organise, conduct and supervise the education of members in the principles and practice of co-operation. It has a staff of twelve local Instructors who give lectures illustrated by magic lantern slides in villages and do such other work as may be entrusted to them by banks. The future of this body is yet uncertain, since it is not adequately supported by Central Banks. Supervision of societies cannot be made over to such an organisation at present. Besides, there are no Institutes in the Nagpur and Chhattisgarh Divisions. A scheme has therefore been evolved with the support of all co-operators in the Central Provinces under which—

(i) Circle Auditors in the Central Provinces would be relieved of the work of audit and entrusted with the duty of education and supervision of societies and their reorganisation in co-operation with Central Banks and the Institute.

(ii) The present number of Federation Auditors would be increased and their pay improved. The staff would be under Registrar's control.

(iii) The Federation subscription of one rupee which is levied from every member of a primary co-operative society in the Central Provinces would be abolished.

(iv) The present system of writing of accounts by society *moharrirs* would continue for the present, but efforts would be made to induce literate members to write the accounts of societies.

(v) The funds for audit by Federation Auditors and for the writing of accounts would be provided from (i) contribution from the profits of societies not under liquidation at 40 per cent of profits, (ii) half the amount of interest on the accumulated reserve funds of societies under liquidation, and (iii) half the interest on the accumulated reserve funds of Central Banks.

Calculations show that there will still be deficit of about Rs. 20,000. It is not possible to meet this by increased contributions, because the scale proposed for contributions from societies and banks is already very high. It is therefore proposed that Government should meet the deficit. This is only reasonable. The Central Provinces and Berar spend far less on co-operation than any other major Province. Under this scheme, it may also be necessary to increase the number of Government Auditors. Conditions in Berar are different. Whereas the number of primary credit societies has decreased in the Central Provinces during the last five years, it has increased in Berar. The average Berar peasant is more intelligent than his Central Provinces confrere, and Directors, both urban

and rural, take greater interest in the co-operative movement. An Institute has been organised for Berar and all the banks and about 500 out of 758 societies are affiliated to it. The Institute is financed by contributions from profits of societies and Central Banks at 15 per cent and 7½ per cent, respectively. The Institute has a staff of 1 Inspector and 9 Assistant Inspectors, and its affairs are managed by an enthusiastic standing committee. It conducts a magazine, publishes pamphlets and holds rallies and training classes, and its Assistant Inspectors visit societies in consultation with Central Banks. It is expected that the societies which have not yet joined the Institute will do so shortly. The Institute is doing good work, but the need for more supervision of societies in Berar is great in order to avoid the deterioration that has set in in the Central Provinces. One solution is to increase the number of Assistant Inspectors; another is to entrust the audit of societies to another agency and to release Circle Auditors for the work of supervision of societies. The matter is under discussion with the Institute and Central Banks, but should there be any financial difficulties in the way of the adoption of a scheme for the more intensive supervision of societies, I think Government should be prepared to make a grant to the Institute.

(3) The land tenure in the Central Provinces under which occupancy tenants cannot lease their holdings for more than a year, or cannot mortgage or sell them is an obstacle to the growth of the co-operative movement. This subject is outside the scope of the Terms of Reference, otherwise I should have liked to suggest that the Tenancy Act should be so amended as to make occupancy holdings mortgagable and saleable in favour of co-operative societies.

(4) The question of the organisation of land mortgage banks in Berar is under consideration. In the earlier stages, a certain measure of assistance from Government is required, and a guarantee of interest by Government for a certain period would be of the highest importance. In the initial stages, Government should also make a contribution towards the cost of valuation of land which would be mortgaged to a land mortgage bank.

(5) To facilitate the transmission of money by money order between Central Banks and societies, Government should refund three-fourths of the money order commission as in the Punjab, Bombay and the United Provinces.

(*a*) (ii) Non-officials, both rural and urban and specially the latter, have rendered valuable services in the past in organising primary societies, Central Banks, the Provincial Bank, the Institutes and the Central Provinces and Berar Co-operative Federation and have devoted much time and attention to the management of central institutions. Without their assistance it would have been impossible to develop the co-operative movement in this Province, and a word of tribute is due to several non-official gentlemen who at the sacrifice of time have laboured and continue to labour in the cause of co-operation. If the non-official agency has not been able adequately to supervise the working of primary societies, it is largely because too much was expected of honorary workers. If, as a result of experience, it is proposed to transfer the supervision of societies largely to Government Auditors, it must not be supposed that there will be no place for honorary workers or non-official agencies in the co-operative movement in the Central Provinces. If any honorary workers or agencies come forward to supervise, educate and reorganise primary societies, their assistance will only be too welcome. The movement cannot have too many disinterested workers. In my case, non-official agency is indispensable in the management of the affairs of Central Banks, the Provincial Bank, the Institutes and the Federation. Non-officials and non-official agencies like the Institutes or Central Banks can also render valuable help to the movement by organising divisional, district, taluk or tahsil conferences and by conducting rallies of co-operative societies which are now being held throughout the Province. They can also organise training classes for members of primary societies. They can assist in the diffusion of co-operative ideas by means of lectures, pamphlets and magazines. The co-operative movement in the Province will be all the stronger for the support of non-official workers and non-official agencies.

(*b*) (i) *Credit Societies.*—There are in this Province 4,071 agricultural credit societies with unlimited liability of which 3,313 are in the Central Provinces and 758 in Berar. The working capital of these societies amounted to Rs. 155 lakhs on the 30th June 1926 and loans to members stood at Rs. 132 lakhs on that date. The number of members in the Central Provinces was 49,000 and that of societies in Berar 11,360. Loans are generally advanced to members at 12 per cent. The extent of financial help rendered to agriculturists by these credit

societies during the last three years will be gathered from the figures of cash loans given below:—

	Central Provinces (000 omitted).	Berar (000 omitted).	Total (000 omitted).
	Rs.	Rs.	Rs.
1923-24 ...	7,54	17,44	24,98
1924-25 ...	9,44	25,62	35,06
1925-26 ...	11,76	17,99	29,76

Most of these loans were for current agricultural purposes, *e.g.*, purchase of seed, bullocks, or petty land improvements, weeding or harvesting, but in Berar loans have also been advanced for the purchase of land, the redemption of old debts and household and ceremonial expenditure. Generally, however, the finance provided by these societies is short-term finance and credit societies, largely depending, as they do, on loans from Central Banks which in turn derive their funds from deposits for one to three years, cannot provide long-term finance. In some societies, members borrow from outsiders, partly because societies do not finance them for all their needs and partly because the members have not been properly educated in the use of credit. The movement is in an unsatisfactory condition, particularly in the Central Provinces, and efforts are being made to weed out bad societies and bad members and to reorganise societies not past hope largely through Government Auditors and partly through the staff of banks. The movement will contract still further in the Central Provinces for sometime, but there is no ground for pessimism. With proper supervision and steady perseverance in educating members in the principles and practice of co-operation through rallies, taluk or tahsil conferences, training classes and the introduction of a share-system which has been promulgated recently, the movement will improve. There are 33,000 and 5,800 villages in the Central Provinces British districts and Berar respectively, and there is great scope for the development of credit co-operation amongst agriculturists. But fresh organisation must be undertaken on sound lines, and care must be taken to free it from the defects associated with it in the period of expansion. For the present, the energies of all co-operators, official as well as non-official, must almost wholly be concentrated on consolidation, especially in the Central Provinces. When the condition of existing societies has improved, there will be time to think of expansion.

(iii) *Societies formed for the sale of produce or stock.*—The question of the formation of cotton sale societies in Berar has been under investigation for some time, and there are three such societies, two of which have been registered recently. Members and non-members bring their produce to the societies. It is sold for them on a commission basis, and a rebate is given to members at the end of the year. In spite of the existence of cotton markets in Berar, malpractices occur frequently, and cotton sale societies would be of economic advantage to the agriculturists in that they would secure honest weighment and the correct assessment of deductions for inferior or damaged cotton. These societies have not yet passed beyond the experimental stage, and it is proposed to observe their working for some time before organising more societies of this type in Berar. It must be emphasised that efficient business management and loyalty of members are essential pre-requisites for the success of such societies.

Co-operation for sale is an advanced form of co-operation and can only flourish in areas where co-operation of simpler forms, *e.g.*, credit, has succeeded. In the Central Provinces, Bilaspur district is one of the few districts where credit co-operation is doing well, and it is intended to examine the question of the formation of some societies for the sale of rice in that area.

The co-operation of the Agricultural Department is necessary both in the formation and subsequent working of sale societies. This fact is fully recognised by both the Co-operative and Agricultural Departments in this Province, and it has been decided to depute an Agricultural Assistant for three years to one of the societies in Berar to help it in management and propaganda.

(v) *Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size.*—The evil of fragmentation is very serious in the Chhattisgarh Division and is a formidable obstacle to any advance in agricultural practice. In Raipur and Drug districts, attention must for sometime to come be devoted to the improvement of credit societies, but in Bilaspur district, co-operative societies for the consolidation of holdings can be formed on the lines followed in the Punjab. As soon as legislation providing for transfer of rights in existing holdings to redistributed holdings is enacted.

an attempt will be made to organise some societies for the consolidation of holdings. In the meanwhile, the Central Bank is conducting some propaganda with a view to popularise the idea.

(vi) *Societies for the co-operative use of agricultural machinery.*—There is scope for such societies in Berar and perhaps in the Nagpur Division, but the question has not been examined by the Co-operative Department. The activities of Agricultural Associations in Berar have been mainly confined to the selling and hiring of ploughs. Labour is comparatively dear in Berar and I believe labour-saving appliances would be welcome. I think the question should be investigated by the Agricultural and Co-operative Departments. The essentials for success would seem to be:—

(i) A ready supply of spare parts and fittings.
(ii) Inspection of and advice regarding replacement of the wear and tear.
(iii) Willingness of central financing agencies to help such societies with funds at reasonable rates of interest.

(vii) *Societies for joint farming.*—I think this type of co-operation is too advanced for this Province, and the want of mutual confidence amongst members might be the rock on which such societies may founder, but it is worth while making an experiment.

(viii) *Cattle-breeding societies.*—There are at present no cattle-breeding societies in the Province. Two cattle-breeding societies were formed in the Raipur district in 1913-14. The members were mostly landowners who purchased a share of Rs. 100 each. Good cows were purchased for members with the help of the Agricultural Department, and suitable bulls were also supplied by that department at nominal prices. Each member was allowed to keep not more than six cows. A large area was given on lease by Government for grazing purposes on very favourable terms. These societies had, however, to be closed down, as members did not take sufficient interest in them.

(ix) *Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above.*—Co-operation can be utilised as means of education and social reform. It is desirable to form societies for compulsory education, for reducing ceremonial expenditure and for arbitration of disputes. But a good deal of propaganda is necessary before such societies can be organised and worked successfully. It is in respect of propaganda in such matters that non-official agencies can be of great use. The assistance of caste and village panchayats would be of great help in the development of this type of co-operation.

(*c*) I understand the question to mean whether legislation should be introduced to compel a small minority to join as members in co-operative societies for joint improvement. If so, my answer is in the negative. If there is compulsion, co-operation, of which voluntary association is an essential feature, ceases to be co-operation. I have, however, no objection to legislation compelling a recalcitrant minority to join in schemes of joint improvement, provided such schemes are not brought within the scope of the Co-operative Societies Act.

(*d*) Primary credit societies have enabled their members to obtain loans from them at cheaper rates of interest than from other sources, and in villages in which co-operative credit societies are working fairly well, the local moneylenders have reduced the rates of interest charged by them. In many of the societies I have visited, some members have been able to pay off their debts and increase their assets, *e.g.*, land, bullocks or to improve their land. The spirit of self-help and mutual help has been fostered to a certain extent. On the other hand, only a few societies have succeeded in securing deposits from members and non-members. Such deposits in societies amount to Rs. 5 lakhs, although it may be mentioned that the share capital held by members of primary societies in Central Banks totals Rs. 11 lakhs. In many societies, neither the panchayat nor the members fully realise their responsibilities. The scrutiny of the purposes of loans and the watch over their subsequent employment are not very thorough. Unpunctuality in repayment is a frequent occurrence.

The Provincial Bank and Central Banks have succeeded admirably in attracting the savings of middle classes, and deposits in the Provincial Bank and Central Banks amount to Rs. 32 lakhs and Rs. 95 lakhs, respectively. Thus, even outside the membership of societies, the movement is proving of value in the encouragement of thrift and the accumulation and circulation of capital for economic purposes.

MR. C. M. TRIVEDI.

Oral Evidence.

29202. *The Chairman:* Mr. Trivedi, you are Registrar of Co-operative Societies in the Central Provinces?—Yes.

29203. You have given the Commission a note of the evidence which you wish to give. Do you desire to make any statement of a general character at this stage?—No, I do not desire to make any such statement at this stage.

29204. Would you please give the Commission a short account of your own experience in the co-operative movement? When did you first join?—I joined as Deputy Registrar in January 1924 and I continued as Deputy Registrar till June 1925. In June 1925 I was appointed to officiate as Registrar, Co-operative Societies, and I continued in that post as Officiating Registrar till March 1926. Then I went on leave and I returned from leave in the middle of November last.

29205. Had you any experience of the movement prior to 1924?—No, I had not any cosiderable experience. I merely came across some co-operative societies in my capacity as Sub-Divisional Officer in the Raipur district. I must have seen about 7 or 8 societies.

29206. If there was any lack of experience it was of course not in any way due to your own action. But have you found such lack of experience any disadvantage in discharging your duties?—Not at present. In the beginning I had to pick up the work.

29207. You did the best you could as you went along?—Yes. I started work actually in the field when I went out on tour at the earliest opportunity after joining as Deputy Registrar.

29208. What was the name of the officer whom you succeeded?—Mr. Roughton.

29209. I think it would be well if we run through, before we turn to your printed note of evidence, some of the information provided in the provincial memorandum which is entitled: *A Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar.* The movement I think was inaugurated in 1904?—Yes.

29210. By 1911 there were seven Central Banks with deposits amounting to Rs. 1,24,520 and a working capital of Rs. 1,74,516. 300 primary societies existed at that time in which there were 9,542 members and those 300 societies had a working capital of Rs. 5,00,000. Is that correct?—Yes.

29211. Then your Provincial Co-operative Bank was organised in order to provide a link between the Central Bank and the money market? Did you prepare the memorandum?—No, my predecessor prepared it.

29212. Have you read it through?—Yes.

29213. Is it correct in its facts?—Yes.

29214. Does paragraph 57 on page 22 of the aforementioned memorandum give the Commission an insight into the full extent of the seriousness of the present position?—Yes, that is a true enough statement of the present position of the movement.

29215. How many societies have failed altogether? I am not sure whether this is mentioned here or not?—Up to date?

29216. Yes?—I have got a statement here. The number of primary credit societies that have been cancelled up to date since the beginning of the movement is 1,452.

29217. And in the past 12 months?—Up to the 30th June 1926, *i.e.*, from 1st July 1925 to 30th June 1926, 191 primary agricultural credit societies with unlimited liability have been cancelled.

29218. Have there been cases in which the acts for which individual members were liable under the system of unlimited liability have been insisted upon?—Yes, joint liability has had to be enforced.

29219. And payments claimed and made?—Yes.

29220. What effect has that had on the reputation of the co-operative movement in the districts in question?—The enforcement of joint liability has produced, to a certain extent, an unfavourable impression about the movement.

29221. Is it your view that on the whole the sound procedure at this stage is to enforce unlimited liability, and where societies are obviously insecure, to claim to the full extent to which a member is liable?—I think theoretically the position is quite sound.

29222. I am asking you about the practice and not about the theory? What is the policy at the moment?—At present we enforce joint liability and we generally pass two orders of contribution: I mean, after a joint liability is enforced twice we do not enforce it afterwards and the remainder is written off as a bad debt.

29223. I do not quite understand what you mean by enforcing it afterwards?—In cases where there is a deficit, say a primary society has to meet a liability of Rs. 300 to the Central Bank and the enforcement of individual liability has brought in Rs. 100, then for Rs. 200 orders are passed in an equitable manner against other members and that joint liability is enforced, say, for a series of two or three years and if the enforcement of joint liability does not bring in the whole amount, the rest is written off by the Central Bank which is the main creditor of the society.

29224. Does that mean the member least inclined to meet his obligations is most likely to escape them?—I should not think so; we see what his assets are and we decide accordingly.

29225. Do you examine the assets of each member who is liable?—Yes, the liquidator does.

29226. Who acts as liquidator?—Generally we have one from the staff of the Central Bank or we have a pleader; or in a very few cases we have a Circle Auditor as liquidator.

29227. Do you often have a pleader?—No, only in about 20 per cent of the cases: I am giving the figure roughly.

29228. And is that person engaged by your department to carry out the work?—Yes, the department appoints him as liquidator and he is remunerated at 5 per cent.

29229. He is chosen by your department as such?—Yes. What happens in practice is this; the Central Bank makes a recommendation and the department more or less accepts it.

29230. Upon whom does the charge of liquidation fall?—On the society.

29231. On the individual society?—Yes.

29232. Are there many members of primary societies who occupy their land on a system of occupancy holdings?—Yes. In the Central Provinces, there must be from 60 to 80 per cent occupancy holdings because of the total, about 60 per cent of the tenants are occupancy tenants.

29233. A cultivator holding his land as an occupancy holding can neither mortgage nor sell?—He can surrender, but he cannot sell.

29234. What security has he to offer?—The only security he has to offer is his personal security. He might have some cattle, but agricultural cattle cannot be attached or sold.

29235. Now, you have systems of tenancy which do enable the occupiers to mortgage, have you not?—Yes, we have absolute occupancy tenants in the Central Provinces.

29236. Have you had any difficulty in societies where you have both sorts of tenants and where you have called up the liability?—I have not quite followed the question.

29237. Well, in a case where one member holds his land under occupancy tenancy and the other under an absolute tenancy, have you difficulty in liquidating when you have to deal with two classes of members?—In that case joint liability is still enforced and the absolute occupancy tenant has had to pay up; that also has made the movement unpopular.

29238. So that although the security is there he has to pay?—Yes; he may be penalised for the want of security on the part of occupancy tenants.

29239. What about the cultivator holding under the occupancy system and not under absolute occupancy?—In his case, in practice, when the society is liquidated we have to recover from his crop or attach his non-agricultural

cattle because houses in villages do not fetch much value. We would have to wait for his crop, and houses are practically unsaleable in the villages; they sell for a mere song.

29240. You have told us in your note that primary societies in the Provinces have lacked vigour?—Yes.

29241. I understand there is very little propaganda directed to educating members of the general public in the principles of co-operation in the villages; is that so?—Yes.

29242. And that, in your view, is one of the causes of failure, is it?—Yes.

29243. During the years in which the movement was getting into difficulties, what system was in vogue for examining the assets and liabilities of members applying for loans?—In practice, the movement in the Central Provinces has been organised on the principle that the duties of organisation, supervision and education rested with the Central Banks and the work of valuation of assets for the purpose of granting loans was done by the Central Bank staff. The Government Auditors have nothing to do with the assessment of credit or with the grant of loans.

29244. But, in fact, did the managing committees of primary societies examine applications for loans, or did they pass the applications straight on to the Central Bank?—In practice, there was some sort of examination, but it was not very thorough; it was very sketchy.

29245. Then, had the Central Bank agents, who went to the cultivator applying for a loan, investigated his affairs?—What happens is that the society, when it wants a loan, either sends in a loan application to the Central Bank or, what is more often the case, the members themselves come to the Central Bank.

29246. Without going to their primary society at all?—What I mean is that the members come there and hold a meeting in the precincts of the Central Bank's office. That often happens, because the members are illiterate; they cannot write their loan applications. They come to the Central Bank, their loan application is written there, and the Central Bank with such records as it has got and with such knowledge as it possesses grants or rejects the application.

29247. It is fair to assume that in many cases the Central Bank cannot have the information and the records to judge of the applicant's suitability?—It will have the records because, when a society comes, it will come with its records.

29248. What about the records of a member applying for a loan?—It will be in the *Haisyat* register.

29249. Who prepares that statement?—The *Haisyat* register is prepared by the Central Bank staff.

29250. On the spot?—On the spot.

29251. Have they a large touring staff?—The staff of the Central Banks generally consists of one Manager and, in case of large banks, one or two Inspectors; we have got a system of what is called Group Accountants; they are really paid by the societies' funds; in practice they are attached to the Central Banks, and each Group Accountant is in charge of 30 to 40 societies.

29252. What is the largest number of primary societies grouped under one Central Bank?—Sihora has 261 societies.

29253. Is it a Central Bank?—Yes.

29254. What is the staff of that Central Bank?—The Sihora Central Bank has got one Manager on a pay of Rs. 95, one Accountant for office work on a pay of from Rs. 50 to Rs. 60, one Inspector on Rs. 40, and it has got 8 Group Accountants, on salaries varying from Rs. 20 to Rs. 35.

29255. When a member of one of the 261 societies desires a loan, he has to go up to the Central Bank in order to make the application?—What often happens is that, at the time of the season for advancing loans, the *moharrirs* are out in the villages, they prepare the loan applications there, and the members come to the Central Bank either in a body or depute the *sirpanch* or secretary.

29256. How far are these committees managing primary societies, in fact, at this moment, examining the assets and liabilities of applicants?—I should put it at about anything from 30 to 50 per cent.

29257. Of all the societies?—Yes.

29258. And the rest are either unwilling or incapable of carrying out the work; is that the position?—More or less that is the position.

29259. Are the Central Banks doing their best to throw responsibility on to the primary societies themselves?—They are doing something, but not as much as could be done.

29260. Do you know of any Central Banks that have gone so far as to discourage primary societies from examining these matters for themselves?—I have not come across any Central Bank which has been discouraging it; in fact, it is to the advantage of the Central Banks, even from a narrow point of view, to encourage societies to examine loan applications.

29261. How do you account for the fact that they are not all doing their best to throw that responsibility on to the primary societies?—Primarily because the Directors of the Central Banks are men who are not generally in real touch with the villages, and the staff is not fully qualified for the work it has to undertake.

29262. I see from your printed note of evidence that you are quite definitely of opinion that, for the moment, the best policy in the Province is to straighten out the affairs of the primary societies operating as credit societies, and not to attempt any other form of society; is that a correct interpretation of your views?—Yes; in the Central Provinces at any rate, I am most strongly of opinion that all our efforts must be concentrated on the consolidation of the credit movement, except in Bilaspur where the movement is doing very well.

29263. On page 35 of the memorandum (page 11 above) it is stated: "The time may be looked forward to when each agricultural association will have its own demonstration plot, as several have. On these will be shown by the agricultural assistant the improved methods to be introduced which the members will undertake to incorporate in their own activities". What societies will those be exactly?—At present, I have got some agricultural associations registered under the Co-operative Societies Act in Berar; two or three of them have got their own demonstration plots, they purchase implements and sell them.

29264. Would the distribution of seeds be their primary function?—At present these agricultural associations do not distribute much seed, to my knowledge. For that, there are what are called Seed Unions, and they are a separate organisation.

29265. *Prof. Gangulee:* Are these Seed Unions registered under you?—Some Seed Unions are, but a good many are not.

29266. *The Chairman:* Then it is stated: "Such associations will get capital by selling seed, implements and manures and arranging for the marketing of members' crops". Is not that rather a curious way of obtaining what, I suppose, would be working capital? I do not quite follow that?—I should much prefer the organisation for the marketing of members' crops to be kept separate from an agricultural association.

29267. I do not quite see how a society engaged in selling seed is going to get capital by selling seed, implements and manure?—What is meant, I suppose, is that they will get working capital out of the profits, but that would be a slow method of doing it. The agricultural associations, I am speaking of those which are registered, have got a share capital of their own; they are organised on a share capital basis; the working capital is provided by share capital and such deposits as they may be able to attract. Some agricultural associations have borrowed from the Central Bank.

29268. Is it your view that matters are in a somewhat sounder position now than they were two years ago?—I think so; financially, we are distinctly sounder than we were, and to a certain extent, in so far as reorganisation has proceeded, we are in a more satisfactory, or less unsatisfactory, position.

29269. Are you founding this reorganisation on a real endeavour to educate your members in the principles of co-operation?—Yes.

29270. What machinery have you got for attaining that end?—At present, I depend on my Circle Auditors; we tried it through the agency of the banks for one year, but we found that we could not get much change out of them.

29271. How many Auditors have you got?—35 in the Central Provinces and Berar, for the Central Provinces 24.

29272. They audit all the societies' books?—Yes.

29273. Have they got time to properly audit all the societies' books?—We have got another set of Auditors called the Federation Auditors, of whom there are 26 in the whole of the Central Provinces and Berar and 24 in the Central Provinces. They do a large part of the auditing.

29274. The Federation Auditors?—Yes.

29275. Whose servants are they?—They are supposed to be servants of the Federation. There is a Co-operative Federation in the Central Provinces and Berar, but it is not functioning at present.

29276. Who pays their salaries?—They are paid from the levy of a subscription of Re. 1 per member from every primary society, and whenever there is a deficit, it is paid by the Central Banks. Out of this Re. 1 are also met the charges for the writing of accounts.

29277. How long do you allow for the audit of each society's books, on the average?—About 2 days; we find each Federation Auditor audits about 90 to 100 societies.

29278. Is that about as much as your auditing staff can achieve, working at top pressure?—There is a certain amount of pressure, but it is not top pressure; at top pressure they can do about 125 societies.

29279. What time do they find to devote to the duties of educating members in the principles of co-operation?—Auditors as such find very little time to do that, but I am asking the Government Auditors to do that, and I have relieved them of the duties of audit, and have made other arrangements for audit; the Federation Auditors are doing the auditing, and I have licensed some other persons as Auditors.

29280. Your suggestion, on pages 168 and 169 of your note, for the strengthening of your department for this purpose, is, it appears to me, a very modest one. It is to add one Circle Officer and certain subordinates. What I am trying to do is to give you an opportunity of saying, if you are of such an opinion, that you think your staff as a whole is quite inadequate to deal with the audit and with the amount of educative work, which presumably must be forthcoming if the movement is to recover. Do you think you are short of staff?—So far as the Auditors are concerned, I am certainly short of staff.

29281. And yet, you are depending upon these Auditors to do the educative work; is that so?—No; I have proposed strengthening the staff by a Government grant of Rs. 25,000. If that is given, the present Auditors will be relieved from the work of original audit. The arrangements at present made are only makeshift arrangements.

29282. Do you think the Auditor is a good man to do the educative work?—He is the best man available at present.

29283. On page 169 you say: "Circle Auditors in the Central Provinces would be relieved of the work of audit"?—I mean, there, original audit.

29284. Perhaps you would make that correction?—I meant original audit, because they will have to do a certain amount of test audit.

29285. What superior audit have you, in fact, at this moment?—Audit by the Circle Auditors in the societies; I have got two Chief Auditors also, and they conduct test audit of a certain number of societies.

29286. What is the average salary of Circle Auditors?—Rs. 85 to Rs. 150; I consider it inadequate.

29287. Do you come across many cases where members are borrowing both from the societies and from the moneylenders at the same time?—Yes; I do.

29288. That is common, is it?—Yes; I should say it is common; especially so in the Central Provinces.

29289. What is your oldest selling society?—The oldest selling society is the one at Akola; it is about four or five years old.

29290. Does it deal in cotton?—Cotton and *juar*.

29291. Is that society in a good state?—It was not making much progress till last year; but now we have reorganised it and we expect that it will make better progress than before. Our main difficulty in the past was due to want of propaganda and want of good and efficient management.

29292. Has it paid any dividend or bonus?—It has paid dividend at the rate of 6 per cent and one year it has paid a rebate also to members.

29293. That is estimated for every 10 rupees worth of credit sold to the society?—It is a rebate on the commission. That is, the societies charge commission just as the commission agents do and a certain rebate is then allowed.

29294. It is a method of distributing profit?—Yes. Non-members also bring in their produce but they do not get the rebate.

29295. Are you familiar with the work of this selling society?—Yes.

29296. With the details?—Yes.

29297. Is any grading carried out by the society?—No; no grading is carried out; but, from next year, we are going to post an Agricultural Assistant and he will do the grading.

29298. Do you look for much advantage from grading?—Yes.

29299. It rather depends on whether the cotton at present passing through the society's godowns is greatly mixed or not, does it not?—Yes. What happens actually is that the cotton is taken down to the gin and there the commission agent grades it; our Agricultural Assistant will do the same thing.

29300. For the society?—Yes.

29301. Does the society gin?—No; it does not gin; at present the cotton is sold unginned.

29302. Has it storage capacity?—No.

29303. So that it cannot hold up the crop?—No; the cotton brought to the market is sold on the same day.

29304. Would you regard storage as a valuable addition to the plant, as offering a valuable addition to its opportunities?—It is rather speculative.

29305. You would rather not see that attempted?—Not for the present; it would involve the society in risks. At present the society runs no risk whatever because it sells on commission.

29306. Do you think the members are getting a better price for the cotton than they would in the open market?—The price fixed is the same; but where the members get advantage is with regard to unfair weighment and unfair assessment of deductions. So far as these two things are concerned, the society ensures better weighment and a fair assessment of deductions.

29307. That is your earliest society?—Yes.

29308. You have been starting new societies, have you not?—Yes; we have started one at Amraoti and another at Dhamangaon; they were registered only last year and they have started working this year.

29309. Dealing with this year's crop?—Yes.

29310. Can you say at all how they are doing?—They have made a most promising beginning. I have made arrangements for propaganda; I have posted one Circle Auditor for propaganda purposes in connection with the sale society in villages served by the Amraoti and Dhamangaon markets.

29311. And they are operating in the same manner as the first society?—Yes.

29312. What accommodation have they, just a small office?—Yes, in the cotton market. At present the man entrusted with the actual business of conducting sales is a co-operator who has experience of cotton business and for the first two years he is prepared to do the work gratis.

29313. The cultivator brings his cotton to the office doors, is that the position?—To the market in which the office is situated; then the rate is fixed and when the rate is fixed the cotton is purchased and taken to the gin where the man who is conducting the sales is present to see to the weighment and to the assessment of deductions. This year we have no trouble about assessment of deductions because all the crop is uniformly of the same quality.

29314. What do you mean exactly when you say that the rate is fixed?—The rate is declared in the cotton market under secret signs. The actual settlement is done secretly and the rate is declared for the day for all the carts; that is the prevailing rate in the market that day.

29315. But fluctuations above and below that *datum* line occur, do they? Is that the minimum rate for the day or is it an absolute rate for the day?—Generally speaking, it is the common rate; but some purchasers might give a higher rate.

29316. Never a lower rate?—Occasionally a lower rate too. The actual settlement of the rate is really done secretly. Suppose the rate for the day is Rs. 80, any one may say "your cotton is bad and I will pay a reduced rate".

29317. The society then acts as a commission agent for the members?—Yes.

29318. And the society never buys any cotton?—No; it simply sells to the purchaser.

29319. Is the officer carrying out the business of commission agent for the society a member of the Agricultural Service?—No; he is not.

29320. What is he as a rule?—In the Akola society, he is the Manager of the Central Bank. In the Amraoti and Dhamangaon societies, he is a co-operator and he is also intimately connected with the cotton business and he conducts the sales. In the case of Akola, from next year we intend to post an Agricultural Assistant to look after the business there.

29321. Would he be responsible for looking after the business of all these societies?—No; only for that one society; we have recommended that there should be one such Assistant for each society.

29322. Whole-time?—Yes, so that in the slack season he will do propaganda in regard to seed distribution and so on and in the cotton season he will be fully engaged on the business of the society.

29323. To what grade will he belong?—He will be an officer more or less of the grade of my Circle Auditor on a pay of Rs. 80—150. There are two grades in the Agricultural Department, the Lower Division grade and the Upper Division grade. If he is in the Upper grade, he will go up to Rs. 250.

29324. And his salary will continue to be paid entirely by the Government?—Yes.

29325. *Prof. Gangulee:* Will he not require some training in co-operative principles?—Yes, he will.

29326. Where will you train him?—He will be trained here.

29327. *The Chairman:* When is he going to be put on this work, next year?—Yes; but he will be placed at my disposal from 1st April next and he will be trained and put in charge of the society from the next cotton season.

29328. What type of managers have these societies secured so far? Are you satisfied with the calibre of the men?—You mean selling societies?

29329. Yes?—I was not satisfied with the type of man that the Akola society had for the last two or three years because he was only a man on Rs. 30 or Rs. 40.

29330. He had many opportunities?—Yes and he might misuse them. But at present I am quite satisfied with the man I have got.

29331. I understand from the evidence of the Director of Agriculture in this Province that for the present you are not of opinion that the co-operative movement can take any useful part in the consolidation of fragmented holdings; is that so?—Yes, except in Bilaspur where the credit movement is in a sound condition; but in the rest of Chhattisgarh Division I do not think it can do anything.

29332. The reason is that you think that the straightening of the credit movement is the first duty before you?—Yes; and I think that though the co-operative movement was not able to do anything for the consolidation of the holdings, other avenues should not be barred.

29333. You do not mean that the co-operative movement will never do anything in that direction?—No, because I say that in Bilaspur it might do something.

29334. I think the two cattle-breeding societies you had decayed, did they not?—Yes.

29335. Did they achieve anything before they disappeared?—I should say practically nothing. I had no personal experience of them as Registrar but only as Sub-Divisional Officer because they were dissolved before I became Registrar; but I knew them fairly well as Sub-Divisional Officer.

29336. What is your strongest Central Bank at this moment, that is, which is the society that has the largest deposits?—Akola and Amraoti; they are two very big banks.

29337. What deposits have they?—Akola has 17 lakhs, Amraoti 20 lakhs, and Nagpur 5 lakhs.

29338. Who chose the managing staff of these banks?—The banks themselves; I have got nothing to do with the selection of the managing staff.

29339. You mean the Committee?—The Board of Directors.

29340. How are the Directors chosen?—In a Central Bank there are two kinds of shareholders, firsly individual sharholders who are not members of the primary societies and secondly members of the primary societies; the Board of Directors is chosen partly by the individual shareholders and partly by the members of societies who are shareholders of the Central Bank.

29341. Are any societies, as such, members of these Central Banks?—All societies are members.

29342. So they too are represented?—Yes and the Directors of the societies predominate in numbers.

29343. Now I come to the primary societies. You told us that a certain important proportion of these primary societies are not capable of managing their own affairs at all. Have they taken a part in appointing these officers to manage the Central Banks?—Yes.

29344. The societies, as such, have representation on the Boards, have they not?—Yes, in so far as they have got Directors on the Central Bank, they can be said to have taken part; on the working committee there are one or two representatives of primary societies.

29345. Is the business of this meeting at which the Directors are appointed carried on in English or in the vernacular?—In the vernacular of the district.

29346. Is the meeting largely attended as a rule?—Generally. In some places we find difficulty in getting a quorum.

29347. You find difficulty in getting a quorum?—Yes.

29348. *Mr. Calvert:* At a general meeting?—Yes, at a general meeting in one or two places we have found difficulty; but generally speaking it is well attended.

29349. *The Chairman:* How far do you regard yourself as responsible for the managing personnel of the Central Bank? Has your department any responsibility at all?—No, it has no responsibility.

29350. That is your view?—It has no responsibility at present, because it does not select them and it does not deal with them in disciplinary matters: it has no control over the staff of the Central Banks.

29351. So that if you knew that a particular Central Bank was being improperly managed, you could take no action; is that your view?—Not that I would not take any action; I should write to them, either officially or demi-officially.

29352. Even demi-officially, if you have no responsibility, I do not see how you could press the matter further?—The Registrar does not appoint them, nor has he any disciplinary power over them; if he came to know things were going wrong, he would do his best to put a stop to it.

29353. To that extent you do feel yourself interested?—Very much.

29354. *Mr. Calvert:* That is not quite complete. You could ask the Local Government to withdraw concessions?—Yes.

29355. And you could liquidate on your own motion?—Yes, I could liquidate the Central Bank or any bank, but that would be an extreme measure to adopt.

29356. And you could ask the Govenment to withdraw the exemption from income-tax?—Yes, if the matter were really very serious, one would do that; but for ordinary petty matters, one could not possibly think of liquidating a Central Bank.

Sir S. M. Chitnavis: The King Committee recommended that Registrars should have control over the staff, but the Legislative Council got that recommendation cancelled.

29357. *The Chairman:* What machinery is at your disposal for watching the Central Banks and the manner in which their affairs are looked after?—I have got my Circle Auditors and Circle Officers; I receive a number of statements from them regarding the Central Banks; the banks are frequently inspected: I go down myself and other officers go down; and the Circle Auditor is there, he conducts a monthly inspection of the bank. Several statements as to the financial position of each bank are prescribed, and they come to me.

29358. How about the Provincial Co-operative Bank?—I get fortnightly statements exhibiting the financial position; I attend all the meetings of the Managing Committee of the Provincial Bank though I am not a member of the Managing Committee; I attend all meetings of the Board of Directors, and I am often in communication with them, because the headquarters of the Provincial Bank are here and I am here.

29359. How far does the Board of Management of the Provincial Co-operative Bank attempt to watch the affairs of the Central Banks; are they watched very closely?—It does to a certain extent, yes, and it largely relies on me for that.

29360. It largely relies on you for its information as to the state of the Central Banks?—Yes. At one time it had an Inspector who used to inspect, but I understand that his criticisms were resented by the Central Banks, and now he has been withdrawn from inspection duty.

29361. Who is doing his work now?—The Provincial Bank has not got an inspecting agency.

29362. Have you an inspecting agency?—So far as my inspecting agency is concerned, it is myself and the Circle Officer; that is my inspecting agency; the Circle Officers are in close touch with the banks.

29363. *Sir James MacKenna:* Who started this idea of putting primary societies so completely under the control of the Central Banks?—You mean which individual started it?

29364. How did that policy arise?—This system was inaugurated in the Province by Mr. Crosthwaite.

29365. How long ago?—More or less from the beginning of the movement.

29366. Is it a fact that in 1920-21 the co-operative movement in the Province got into such a state that they had to apply to the Government of India for a loan of 24 lakhs?—Yes, that was during a banking crisis; the bank dissipated its fluid resources, and it had not money to pay the depositors; on top of that came scarcity, so that there was not enough money to finance the Central Banks; Government assistance had to be given in the shape of a Government loan of 19 lakhs. It was purely a banking crisis.

29367. *Sir S. M. Chitnavis:* Altogether 19 lakhs?—Yes.

29368. *Sir James MacKenna:* Has that been repaid?—Yes, it was repaid in full in 1925.

29369. What were the relations between your Provincial Bank, the Central Banks and the ordinary banks in the Province?—The Provincial Bank has got a cash credit with the Imperial Bank to the extent of 4 lakhs, that is a cash credit on pro-notes of primary societies.

29370. *Mr. Calvert:* Endorsed by a Central Bank?—Endorsed by the Central Bank and by the Provincial Bank too.

29371. *Sir James MacKenna:* Did they lessen or withdraw that guarantee during the crisis when the movement was in such a shaky condition in the Province?—No, I think it remained the same. It was 2 lakhs and it remained the same, and last year it was increased to 4 lakhs.

29372. That looks as if the outside banks were getting a little more confidence, does it not?—Yes, it does indicate that.

29373. With regard to liquidation, the figure you gave to the Chairman I think would lead to the inference that about 25 per cent of your societies have been liquidated, while in your printed memorandum in answer to Question 22 *(a)* the number of societies at present under liquidation is 12½ per cent. Even the latter figure is a very large one?—Yes, I gave the total figure to the Chairman.

29374. Why has there been so much liquidation?—We have to liquidate bad societies; bad societies are due to a large extent to what I consider to be defective organisation in the past.

29375. Is not there any *locus penitentiæ;* do you not resort to liquidation as the very last step?—Yes.

29376. Do you not try to bolster them up?—No, we do not try to bolster them up; when we find a society cannot be revived, we put it into liquidation.

29377. You said the liquidation was frequently done by pleaders?—I said about 20 per cent.

29378. Who do the rest, your own Assistant Registrars?—No, that is done by the staff of the Central Bank. It is done to a certain extent by my own staff, but to a very small extent.

29379. Would you agree that they are in a better position to conduct the liquidation than an outside pleader?—Yes.

29380. They are in a better position to get at the real facts of the case?—Yes. Those 20 per cent consists of old cases; at present I do not entrust liquidation to a pleader if I can help it, because they do not find time to go out into the villages; they have to do their work from headquarters.

29381. What is the process of liquidation. Who confirms the liquidation?—At present there is no appeal against the order of the liquidator according to the rules in this Province. Mr. Crosthwaite was strongly opposed to it.

29382. Is there no appeal against the order of the liquidator?—No, unless there is a remedy in the civil court; to the Registrar there is at present in the rules no appeal.

29383. The liquidator's award is final?—Yes.

29384. *Mr. Calvert:* Under certain conditions?—In certain Provinces, the rules under the Co-operative Societies Act provide for an appeal to the Registrar or provide for confirmation of the liquidator's order by the Registrar.

29385. *Sir James MacKenna:* The position in Burma is that the liquidation is confirmed by the Registrar, from whose decision an appeal lies to the Financial Commissioner?—There is no such thing here.

29386. You have not dealt with land mortgage banks yet, have you?—No, I simply said the question was under consideration; we are thinking of it.

29387. Have you any idea of the line you would take?—I think the lines would be largely those decided upon by the Registrars' Conference last year; they went into the question in great detail.

29388. Acting under the existing Act?—Yes.

29389. Without any special legislation?—Yes.

29390. What is your view about co-operation in general? Would you not agree that the movement is likely to have little solidity until we have less of this sentimental talk about the beauties of self-help and co-operation, and inspire into our members a little more ordinary commercial honesty?—I feel we must base the co-operative movement on the solid material advantages we can offer the members of primary societies; we should not make too much of the moral advantages: not that the moral side should be neglected, but the moral side will not appeal to the people unless and until you show them the material advantages to be derived from organisation in co-operative societies.

29391. You agree that the ultimate test is business efficiency and business honesty?—Yes.

29392. *Prof. Gangulee:* Do liquidations of societies tend to decrease the confidence of the people in the co-operative movement?—If they are on a large scale in any particular district they would tend to decrease confidence, but if only a small number of societies are liquidated in a particular district, I do not think that would have any appreciable effect on the amount of confidence which the villages have in their primary society.

29393. As I understand, the process of weeding out bad societies in this Province is going on at a rather good speed?—It is going on at a fair rate, yes.

29394. What has been the effect of that on the movement, speaking generally?—In one or two districts it has tended to lessen confidence, but in those particular districts the movement is really in a state of suspended animation.

29395. On page 22 of the provincial memorandum* you state the causes of the deterioration of the co-operative movement; having stated the two first causes, one being the too rapid expansion and another being series of bad seasons, and so on, you come to the third cause and you say: "the discipline of Government control, upon which the stability of the movement in the past has almost entirely depended, has been relaxed, and has not yet been replaced by the discipline of good citizenship". Could you amplify that?—I suppose what the writer of the memorandum meant was that in the past the advice of the department used to be listened to and during the non-co-operation period it was not listened to so much. That is what I think he meant.

29396. When you say that discipline and Government control have been relaxed, what do you mean? Why were they relaxed?—I think that was the case because the people were averse to accepting advice of the department, but things are very much better now. As a matter of fact, I was told that in the non-co-operation period people in one district went about saying that these co-operative societies need not be paid, and that if they did not pay them then there would be no occasion for them to pay in future. I think that was what was really meant, because the statutory control remained the same as at present. Things are very much better now.

29397. Then you say that though sufficient money is now available for the financing of the movement, it is not being used fully as the rates of interest demanded from members are regarded as excessive. Why did you not reduce the rate?—The rates have been reduced as much as possible. Members are charged 12 per cent. In addition we have a scheme for the utilisation of the reserve funds and under that scheme 500 societies are admitted; the rates vary from 9 per cent to 11½ per cent and the question as to whether the rates can be reduced further or not is a financial one.

29398. I have one or two questions to ask you on primary societies. Do you undertake any survey of an area where you propose to work a society?—At present our system of organisation is this, that in case there is any demand for a society in a particular village it is organised by the organiser and altogether three visits are paid to that society. After an interval a Director visits it, and at another interval the Circle Auditor visits it, and, if they all agree, the proposal is sanctioned and registered after these investigations.

29399. What do you really investigate in these series of visits?—We enquire into the correctness of the statements made by them into their assets and liabilities, into their reputation in the village and into the general reputation of the village also, I mean, in matters such as proneness to litigation and things like that.

29400. Could you kindly tell the Commission very briefly the history and development of a very well-organised village primary society that you know of, one that you consider the very best, working very efficiently and to your satisfaction? You just stated about Bilaspur having a number of village or primary societies which are working very well. Can you select one from that area?—The dominating feature in the Bilaspur societies has been that there are very few arrears, the total would amount to, I think, very little. In fact from the latest statement I find that the arrears on the 30th June were practically *nil*. But even in Bilaspur they have not been able to attract deposits in societies themselves. In Berar, several societies are able to attract deposits.

29401. But the point I wanted to get at is this: I want to trace the history and development of a village primary society which you consider now to be very efficient, well organised and which satisfies the Registrar? Can you give me very briefly one instance only?—I have one society in mind in which there are deposits of non-members and they do not borrow from outside; it is a society in which there is a very satisfactory measure of punctuality and meetings are held, accounts are written by members themselves, loan applications are also written by them, a scrutiny of the loan application is made on the spot by the members of the managing committee, and they have been able to increase their assets.

*Not reprinted.

29402. These are the outstanding features of that society which you refer to? Is it your impression then that such a society which you have described just now has reduced to any extent the indebtedness of the people?—In that particular society I believe there has been some increase of indebtedness but it has been more than balanced by an increase in assets, so that you might consider that the net result has been a reduction of the indebtedness.

29403. Has that society's work any effect on the moneylending business of that area?—Distinctly. As a matter of fact in that village there are no moneylenders.

29404. You state that credit societies are increased in Berar? To what factors do you attribute the success of the movement in Berar, as compared with the Central Provinces?—In Berar, the people are more intelligent, better educated and the Directors of the Central Banks take greater interest both in the case of rural and urban areas; the land tenure in Berar is also favourable for the growth of the co-operative movement.

29405. Would you be prepared to say that the two fundamental factors working there are the system of land tenure and the extension of money crops, such as cotton? Do you think that these two factors could be taken to be the main causes of the success of the movement in Berar?—Yes, *plus* the greater intelligence and the greater interest taken by the people in the movement itself.

29406. Are there no malguzars in Berar?—No.

29407. As regards the new type of primary societies which are being organised, what steps have been taken for remedying the defects of the older type?—In the new type of society we have tried to shift the centre of gravity of the movement as far as possible to the society itself. The present type of society in vogue in the Central Provinces is not a share type society, that is to say, it has not got any share capital of its own although members of primary societies take shares in the Central Banks in proportion to their borrowing. In the new type of societies, members themselves hold shares in the societies instead of in the Central Bank. In the old type, the proportion of share capital to borrowing was 1 to 10; in the new type it has been reduced to 1 to 20 and a certain maximum share holding has been fixed. It is left to the discretion of the society to fix the maximum or not. In the old type the reserve fund was invested outside the business of the society; in the new type it is invested in the business itself, so that members should have a greater interest in the management of the affairs of the society, because they will find that if they make any bad use of that money by granting indiscriminate loans the reserve fund will go.

29408. You state on page 171 that in some societies members borrow from outsiders? Who are these outsiders?—They may be village moneylenders or malguzars for instance.

29409. To what extent do the malguzars dominate the situation?—It all depends on conditions in different villages. In certain villages they dominate and in certain villages the malguzar himself may be indebted. I mean the source is outside the co-operative society.

29410. Do you know the rate of interest charged?—It varies. Sometimes it is 18 per cent, sometimes it is 24 per cent. In Mandla, the rates charged by Kabulis go up to 48 and 50 per cent.

29411. You say here that the Central Provinces and Berar spend far less on co-operation than any other major Province? What is your total budget allotment?—It was about Rs. 1,74,000 last year.

29412. Do you think that the progress has been impeded by lack of funds or by the paucity of educational workers?—I think improvement in the condition of the movement is restricted by the lack of funds at present, because if we had more funds we could place at the disposal of the movement more agencies for education and supervision. I mean if we cannot get free enthusiasm we could at least get a paid staff; if we could get neither money nor enthusiasm we should remain where we were.

29413. Are you satisfied with the non-official assistance that you have hitherto received?—Yes, in a certain way. Non-official agency has done quite a lot; one really does not expect agencies of this nature to go into the villages, but so far as work in the headquarters is concerned I am quite satisfied with

it, save for a few exceptions. You cannot expect non-official agencies to go into the villages and be in touch with societies, with the rural conditions, and to know and realise the wants and needs of members. That is what they are expected to do under the present system of the organisation of the movement.

29414. So far as the village primary societies are concerned and the movement generally is concerned, have these non-official gentlemen, to whom you pay tributes here in this note, gone into the villages and helped you?—No, not in the villages generally, although there are instances where gentlemen have gone to the villages for this purpose.

29415. Do you think you would succeed in reorganising societies or do you hope to do so without the assistance of non-official organisers? Would you be able to teach the people without the assistance of non-official gentlemen?—Their assistance would be very welcome to me.

29416. Do you think that spoon-feeding by Government can give life to this movement?—Assistance by Government will give life to the movement and I do not think that that can really be said to be spoon-feeding.

29417. Money may come from the Government, and auditing and other controlling agencies may be supplied by the Government, but you will perhaps agree with me that the creative impulse, the vitality of the movement must come from the people?—Yes, if the primary societies themselves are not willing to improve themselves, the movement cannot be improved.

29418. And these primary societies cannot improve unless some sort of non-official agency stands by them?—I should be very willing to have a non-official agency.

29419. Do the primary societies admit the less prosperous cultivator, that is a man with say 2 or 3 *bighas* of land?—Yes.

29420. What is the nature of the liability accepted by the Central Bank?—It is limited.

29421. And what is the security on which Central Banks sanction loans?—There is unlimited liability.

29422. When Central Banks give money to primary societies, do they not ask for some sort of security?—For long-term loans if there is a tangible security, *viz.*, transferable right in land, mortgages of land are taken, and mortgages in Berar are frequent.

29423. Do these Central Banks sanction loans to non-credit societies?—Up to the last year Central Banks were debarred from dealing with non-credit societies but that restriction has been removed now and in only one case has a Central Bank advanced a loan of Rs. 2,000 to an agricultural association.

29424. Are individual members of the Central Bank eligible for loans?—No.

29425. When you say that the Central Banks have not been able to perform their duties adequately, do you mean to suggest that the reason for that is insufficient staff or supervision?—Yes, in some cases that is so, and in a good many cases they are not adequately equipped to do their work.

29426. *Sir S. M. Chitnavis:* You think that the staff is insufficient?—Yes.

29427. *Prof. Gangulee:* Do you think that the combination of financial and supervisory functions in the Central Bank is satisfactory?—I would like to separate finance from supervision as far as possible.

29428. How would you achieve that end?—By transferring the work of supervision largely to the Government agency.

29429. Would you like to create a Board of Supervision?—I would like to transfer this work of supervision to Government Auditors, who would then be really Inspectors.

29430. Do you think co-operative societies can be employed in connection with the grant of *taccavi* loans?—Do you mean, instead of giving the loans to individual members, they should be given to the societies?

29431. Yes. Could you employ co-operative societies for the purpose?—Yes, I suppose it could be done.

Sir S. M. Chitnavis: In 1921 the Central Banks were utilised for the purpose.

29432. *Prof. Gangulee:* In that case, what procedure would you adopt? How would you incorporate, in your co-operative societies, the arrangement for granting *taccavi* loans?—I suppose the loan could be made directly to a society on its unlimited liability, but perhaps, it would be preferable to deal with a central organisation instead of dealing with individual societies.

29433. We have been listening to an account of the efforts at consolidation of holdings in this Province. Has any one been sent to the Punjab to see how they have achieved that end through the co-operative movement?—No one has been sent to study it in detail; Mr. Roughton was there for about a fortnight, but no one has actually studied it in great detail.

29434. Have you in your possession any report submitted by Mr. Roughton?—I have.

29435. On the consolidation of holdings in the Punjab?—Yes.

29436. You said that it was desirable to form societies for compulsory education. Have you any idea how such societies could be organised?—There I was really thinking that there might be a society where there might be a by-law that members of the society should agree to send their sons to a particular school.

29437. *Mr. Calvert:* On the Punjab model?—Yes. If we could get such societies, we might get on to the Education Department.

29438. *Prof. Gangulee:* Is the Registrar a whole-time officer?—No; he combines the functions of the Director of Industries and Registrar, Joint Stock Companies, he is also the Chief Customs Authority, but there is not much work in connection with that.

29439. Do you think it would be desirable to have a whole-time officer for the co-operative movement in this Province, in view of its deterioration?—It would be desirable; it would be necessary if the work of the Industries Department expands.

29440. *Mr. Calvert:* Do you not recollect that when Mr. Roughton went to the Punjab he took with him 2 or 3 non-official members?—Yes.

29441. He did go into the question of the consolidation of holdings in some detail and Rao Bahadur Jagannath Prasad and Rao Bahadur Brahma who accompanied him went into great detail?—Rao Bahadur Brahma did not go into great detail, but Rao Bahadur Jagannath Prasad of Bilaspur went into the question in some detail, and he has sent in a report also.

29442. You are also Registrar of Joint Stock Companies?—Yes.

29443. Is it your experience that joint stock companies fail and go into liquidation?—Yes.

29444. Have you ever heard of banks, even run by Europeans, failing and incurring losses?—Yes.

29445. So that, co-operative societies are not the only associations that sometimes come to grief?—No; all kinds of businesses come to grief, and co-operative societies are no exception to that.

29446. From this crisis of 1921, would you draw any definite lessons or warnings?—Yes; ordinary banking principles should never be neglected; that is one great warning.

29447. Was that crisis made possible by the collection of the fluid reserves at the top?—The position at the time was that the Provincial Bank was supposed to maintain the fluid reserves for the entire co-operative movement, and in return for that the Central Banks were passing the reserve funds of the societies to the Provincial Bank at 3 per cent interest.

29448. Their fluid resources had been collected at the top, and, being there they were put to uses for which they were not intended?—Yes.

29449. If they had been kept with the original societies, that would not have been possible?—No, it would not have been possible for the Provincial Bank to dissipate the fluid resources in the manner it did, if they were not with it.

29450. Are the Central Banks largely controlled by urban Directors?—Yes.

29451. And they deal with the applications for loans?—Yes; the applications for loans are dealt with by the working committee.

29452. Is their willingness to accede to applications for loans influenced by the occasional large surplus cash balances?—Not at present, but it was so in the past. Financing at present is done very cautiously, but in the past there has been indiscriminate financing.

29453. In fact, when they had a large surplus in hand, that would incline them to be really easy in giving loans?—Yes, and also to find an outlet for the funds; they tried to organise societies in order to get rid of their surplus funds.

29454. From what class are the Managers of Central Banks drawn; from the rural, the cultivating, or the urban class?—Largely from the urban class.

29455. Are they trained?—They were not particularly trained, but for the last two years I have been opening training classes for a month every year.

29456. You find difficulty in getting thorough training in banking principles for your Managers?—Yes; as a matter of fact, I do not know of any place where they can be trained in the principles of banking.

29457. You have probably heard that the Imperial Bank of India have the same difficulty. You mentioned that some banks like the Sihora Central Bank have maintained an Inspector?—Yes.

29458. What class of man is he?—He is the sort of man who has served in a bank for a long time as Group Accountant. The particular Inspector of the Sihora Bank happens to be a very good man; he has put in 15 years' service.

29459 They are promoted from below?— Yes.

29460. Is there any admission direct from the graduate class?—No.

29461. Are they given any training in rural economics?—No.

29462. Is my book *Law and Principles of Co-operation* used as a text-book?—It is largely used in our refresher classes. In our training classes, we have made use of it.

29463. To what extent could the staff in touch with societies pass a pretty stiff *viva voce* examination on that book?—It is very difficult to say. Are you referring to the staff of the Central Banks?

29464. All the staff employed in connection with societies; you call them by various names?—It is really difficult to say to what extent they would pass such a test. I do not suppose all would pass.

29465. Do I gather that you do not put them through an informal examination. As you go on tour and meet the staff, do you put them through an hour's cross-examination on the book?—I do not put them through a test on that book, but I do put them through a test so far as co-operative societies in that tract are concerned, to test their co-operative knowledge.

29466. Are the Federation Auditors thoroughly trained in this book?—Some of the Federation Auditors do not know English, but those that do know English know this book; I cannot say they are thoroughly trained, the Government Auditors are trained.

29467. From what class of person is your Federation Auditor drawn?—Is he drawn from the cultivator class or the urban class?—He is largely drawn from the urban class.

29468. Is it not part of your policy that the Auditor must be of the cultivator class of the same locality as the bank?—It has not been so so far; we wish to draw the staff from villages as far as possible. At present, I am only recruiting graduates for the posts of Government Auditors.

29469. Could you just clear up a little matter on pages 169 and 170 of your note, from which I gather that primary societies have to pay 40 per cent of their profits towards Federation Auditors and a further 15 per cent towards some institute?—No, this scheme was to apply to the Central Provinces only; it was not to apply to Berar. This 40 per cent is not only for audit but for writing of accounts also; it includes both, so that 60 per cent balance would remain with the societies. As a matter of fact, the proposals are being modified at present. What I wish to do is to levy 7½ per cent to 10 per cent for audit only, not more. I wish to separate the two, and levy 7½ per cent to 10 per cent for audit, and leave the societies of the Central Provinces to make their own arrangements for the writing of accounts.

29470. You state that the land tenure system, under which these tenants cannot mortgage or sell, is an obstacle to the growth of the co-operative movement. Does that mean that in this Province you have given up character as the basis of your movement?—No, we have not given up character, but we find that absolute occupancy tenants, for instance, are not willing to go into the movement, because they fear that if there is any default, the burden will fall on them.

29471. Have you got in this Province any separate societies for the menial class, the ordinary landless labourer?—We have not got any separate societies for them.

29472. Any societies for people like the *tonga* drivers?—No, we have not.

29473. For people without any landed property?—No. We have got two sweepers' societies, and we are thinking of organising one sweeper society in Nagpur.

29474. In that case, your basis there would have to be such moral fibre as they possess?—In these sweepers' societies we recover the dues through the Municipal Committee; they are authorised to deduct it from the sweepers' pay.

They are not based entirely on the people's character.

29475. In answer to another question, you say that non-officials, especially of the urban class, have rendered valuable services in organising primary societies?—Yes.

29476. Are these the primary societies which have, to a large extent, failed?—Some of them have failed.

29477. Are not these non-official organisers usually busy professional men?—Yes, generally. Some of them may be landholders, but generally they are busy professional men.

29478. Who will find difficulty in giving as much time as they would like to the work?—Yes.

29479. Does it mean that their connection with the society is apt to diminish or come to an end when the organisation is done?—These non-official gentlemen are generally Directors of a Central Bank, and when they find time they go to the villages and organise societies; their actual contact with that particular society after that may have ceased, they may not go to that particular society, but they would remain in touch with the society as far as the headquarters are concerned when members come to the headquarters.

29480. Do they follow up the organisation by persistently teaching the members the way to run their own affairs?—It has not been done generally.

29481. The difficulty is not in the organisation but in the teaching?—Yes, in the teaching and supervision.

29482. And the connection between the original organiser and the society is apt to come to an end?—Yes; that is to say, the organisers are not made responsible for the subsequent working of the society.

29483. If one of these societies goes into liquidation he is not made to do the liquidation work?—It may not be that particular man himself, but the staff of the Central Bank.

29484. Not necessarily the organiser?—No; not necessarily the organiser. In some cases the organiser may not be there; he may be a temporary servant of the bank.

29485. In giving the figures for loans last year it seems that the average per member in the Central Provinces is about Rs. 24 as compared to Rs. 157 in Berar. Does that mean that the societies in the Central Provinces are in rather a worse stage than the figures of liquidation would suggest?—But all these 49,000 have not taken loans.

29486. That is the average?—Yes.

29487. The average of the Central Provinces is very low compared with that of Berar?—Yes.

29488. They are less active than the figures of liquidation would suggest?—But the needs in the Central Provinces are smaller, too, than those in Berar.

29489. Hitherto you have not had the Punjab share system in the Province?—We are adopting it now; our system is modelled now more or less on the Punjab system.

29490. Was it not the rule in this Province that your primary society's reserves were taken out of the society?—Yes.

29491. And you are now trying to go back and put the reserves back into the society?—Yes.

29492. You mentioned to Professor Gangulee that you were trying to use the reserve funds to lower the rate of interest of primary societies?—Yes.

29493. Would you explain the system at present?—At present the reserve fund is invested outside and that reserve would earn an interest of 5 per cent. So our scheme is that as soon as the reserve fund of the society reaches 10 per cent of the normal working capital we should utilise the interest on the reserve fund towards the payment of the Central Bank's claim. I will give a concrete instance. Suppose, for instance, there is a society the normal capital of which is Rs. 1,000 and its reserve fund is Rs. 200. That reserve fund will earn interest at the rate of 5 per cent; that is Rs. 10. This amount of Rs. 10 will be paid to the Central Bank to meet its claim so that the members will have to pay Rs. 10 less for interest; so that on Rs. 1,000 they will have to pay Rs. 10 less which means that the rate of interest will be reduced by Re. 1.

29494. What is the lending rate of your primary societies?—12 per cent.

29495. If you utilise the reserve fund, it will go still further to reduce the rate of interest?—Yes.

29496. The main result of the working up to date is that your Provincial Bank is perfectly sound, the Central Banks are sound and your primary societies are weak?—Yes.

29497. Is there a maximum rate of dividend for the Provincial Bank and the Central Banks?—The maximum is limited to 12 per cent; but the maximum has never been reached; the maximum declared by the Central Bank has never been more than 8 per cent.

29498. *Prof. Gangulee:* But in some banks you have not declared a dividend at all?—Because the interest has not been realised.

29499. *Mr. Calvert:* You use in this Province the Public Demands Recovery Act to help you to recover amounts from defaulters?—Yes; it may be recovered as arrears of land revenue; it is under the Land Revenue Act; an amendment has been introduced under that Act.

29500. Is that much used?—Yes. The Registrar has to certify before that is put into force.

29501. Does that give results more quickly than when working through a liquidator?—In a good many cases it does.

29502. I gather from your replies to one of my colleagues that you pay your liquidators 5 per cent on recoveries?—Yes.

29503. That is an even rate throughout?—Yes.

29504. You have not tried to pay him a higher rate as the work proceeds, that is, 5 per cent for the first third, 7½ per cent for the second third and 10 per cent for the rest?—No, we have not tried that. In the beginning it is easy to recover and it becomes more and more difficult to recover as time goes on.

29505. Does your department co-operate to any extent with the Education Department? Do you help each other in the field?—No.

29506. You do not arrange for lectures in the normal schools and things of that sort?—In Berar, we do deliver lectures in the normal schools. The Berar Co-operative Central Institute sends its Inspector to lecture on co-operation. The idea is ultimately to use the schoolmaster for the work of writing of accounts of societies and do away with the Group Accountants' system.

29507. But is it not better, for instance, that the co-operative societies should work in the closest possible touch with the Education Department?—So far we have not considered that question.

29508. You expressed the opinion that the Government expenditure on co-operation was rather less than in other Provinces and you give the figure of Rs. 1,74,000 which works out at about Rs. 2½ per head. Is not that rather higher than, say, in the Punjab?—I do not know if it gives the same results on the working capital.

29509. Can you let us know, briefly, just to what extent Government does aid this movement? How does it aid the Federation at present?—At present the Government does not give any grant to the Federation.

29510. How many Auditors is it paying for?—Government is paying for 35 Auditors.

29511. Does it pay for the education staff, the Inspectors like those we have in the Punjab?—No.

29512. Does it pay for any special propaganda staff?—No; but last year Government made a grant of Rs. 3,000 to the Northern Districts Co-operative Institute and Rs. 2,800 to the Berar Co-operative Institute for lectures on co-operation illustrated by magic lantern slides, and this year we are giving a grant to the Berar Co-operative Institute for propaganda in connection with cotton sale societies.

29513. Do you take your staff, or send your staff, regularly every year to the agricultural farms?—No.

29514. Do any of them receive courses at the Agricultural College?—No; but I am thinking of that.

29515. *Mr. Kamat:* Speaking about the cotton sale society in Berar, you said the rates of cotton for the day were fixed secretly?—The actual settlement of the rate is done under secret signs.

29516. The rates fixed are the maximum for the day?—I have known of cases in which cotton has been sold at a higher rate than that which is supposed to be the ruling rate.

29517. Are these rates fixed arbitrarily or do they depend upon telegraphic advice from Bombay or from overseas?—They receive telegrams from Bombay and they take that rate into account in fixing the rates.

29518. If that is so, have you any agency to watch the ruling rate for the day; to see if the rate is much below what ought to be the rate according to the telegraphic advice, or the condition of the cotton market in Bombay for that day?—No; the cotton selling society has no such agency.

29519. The relief which this cotton selling society can possibly give to the producer is perhaps security so far as correct weighment is concerned and, perhaps also, the safeguarding of deductions?—Yes; that is all, so far.

29520. But it cannot ensure a fair rate corresponding to the rate which ought to prevail according to the Bombay and other markets?—No; it does not, because it has got no agency.

29521. In that respect, therefore, you fail to give relief to the producer?—Yes, in so far as the rate declared in the market is not in accordance with what it should be.

29522. Then have you considered whether it is feasible to maintain a telegraphic service or a cable service to ascertain the actual market rates either in America, or in England, or in Bombay and to give the benefit of that cable service to the people here?—No; we have not considered that.

29523. Supposing you introduced that, do you think it would be feasible to give the producer, the cartman who brings the cotton for sale, an approximately correct idea of what the cable advice in Bombay is? Could you, without much expense, maintain some sort of agency to give him the benefit of knowing whether the rate goes up so many points or down so many points, above or below the price fixed for the day?—I think an arrangement to get information about the Bombay rate would not cost much.

29524. Your department has not thought about that; you think it could be done?—Yes.

29525. *Sir Ganga Ram:* Are not the rates hung up?—Yes, after they are fixed.

29526. *Mr. Kamat:* They are fixed by some other people, not by you?—Yes.

29527. You know the process of fixing the rates under cover?—Yes.

29528. *Dr. Hyder:* Is there a wide variation between the rate prevailing at Bombay and the local rate?—Not very much, I think; the rates in the local

markets have to be calculated; the Bombay rate is for ginned cotton and it has to be converted into terms of unginned cotton and the freight charges and ginning charges are to be allowed for.

29529. They are the two items for reduction?—Yes, and also allowance should be made for the cotton seed.

29530. *Mr. Kamat:* Talking about Central Banks and the election of the Board of Directors, is there no method by which you nominate somebody on behalf of your department as one of the Directors and watch the proceedings of the bank? Supposing there were nine Directors, is there no procedure by which that can be done giving your department one?—No; it is not provided for in the bye-laws; the idea was that the Central Banks should actually manage its own affairs.

29531. One man on behalf of the Co-operative Department out of, say, eight or nine would not be much; he would merely watch and not interfere?—Generally we arrange to attend meetings of the Board of Directors; one of the members of my staff generally attends the meetings of the Board of Directors.

29532. Informally: he has no *locus standi*?—No, he is not a Director but he does attend on behalf of the department.

29533. You spoke of the pleader liquidator; are such men appointed liquidators because they are pleaders or because of their knowledge of the co-operative movement?—They are appointed because they know something about co-operation and because they know something about the law, and because we sometimes find it difficult to get other people to do it.

29534. What is your experience? Are these pleader liquidators more expeditious and better on the whole than other liquidators whom you may have appointed?—I am sorry to say my experience of some lawyer liquidators has not been very happy in the matter of expedition, because they say they have got their own case work to attend to; I have had to cancel the appointments of certain lawyer liquidators.

29535. That was due to their want of time; it was not with reference to their knowledge of law?—I was not concerned with the causes of delay; the main thing that confronted me was the delay.

29536. *Sir Henry Lawrence:* How are they remunerated?—They are remunerated by a payment of 5 per cent.

29537. *Mr. Kamat:* With reference to what has been said about spoon-feeding, so far as your knowledge of State aid to co-operative societies in other countries goes, for instance, in Holland, is it not the case that co-operative societies in that country receive greater aid from the State than in India?—I do not recollect now the details of the assistance given in Holland.

29538. Do you mean to say there is no State aid in other countries?—No, there is a great deal of State aid everywhere.

29539. So that if help from the Government is to be called spoon-feeding, that is not peculiar to this country?—No, as a matter of fact, State aid is given in every country.

29540. Nowhere has the co-operative movement grown without State aid?—State aid has been essential to the movement and has enabled it to develop on the right lines.

29541. You have paid a tribute to the non-officials who have assisted the movement, but in your oral evidence you have said that some of the primary societies started by non-officials have come to grief because those non-officials did not follow up their initial work and maintain the efficiency of the primary societies in villages?—Yes.

29542. Without the help of the non-officials in starting such societies, in holding conferences, and helping in other ways, do you think your movement would have spread as much as it has?—I do not think it would have spread as much as it has.

29543. And do you not think it would be too much to expect non-officials to stay in the villages, giving up their profession or business, simply to maintain the primary societies, train them up and look into their accounts?—Yes.

29544. The fact of the matter is, that there is not enough literacy in the villages to maintain the necessary efficiency?—No.

29545. For instance, in Berar you admit that the state of the co-operative movement is better than in Chhattisgarh, because the foundation is there?—Yes.

29546. It is not merely the non-official element; it is the foundation?—I do not blame the non-officials; I am blaming the system under which they have been made responsible for a number of things which they are not in a position to do.

29547. Does the lawyer element take sufficient part in this movement?—Yes.

29548. And do men from the colleges help you?—We have not been able to get many new recruits to the movement from the college people.

29549. Do you find that people who never go to the villages themselves nevertheless are prepared to criticise others for not going to the villages and doing social service in connection with the co-operative movement?—There has been a certain amount of talk of that kind.

29550. *Sir Ganga Ram:* How far has this movement tended to reduce the interest which moneylenders charge?—Do you mean generally speaking?

29551. Yes, generally speaking?—In villages in which there are co-operative societies moneylenders have reduced their rates of interest almost to the same rate as that charged by the societies in some villages.

29552. The rate charged by the societies is 12 per cent?—It is 12 per cent at present.

29553. Generally in the whole Province, with what percentage of the total indebtedness do you deal?—As I said, we deal with about 60,000 members.

29554. What proportion of the total credit requirements of the Province do you meet?—I have not got the figures; I have no idea what the total indebtedness of the Province is.

29555. Are not the Bombay rates hung up every morning in the markets; that is our rule in the Punjab?—Yes, they are hung up and the rates actually declared in the market are also hung up.

29556. You say all the details have to be worked out?—Yes.

In the Punjab we have a formula which every one knows; supposing the rate per *khandi* is 250, we deduct 30, divide by 10, and that is the rate for the *kapas*.

29557. Are you a member of the Central Cotton Committee?—No.

29558. Are you not a member *ex-officio*?—There was a proposal to make the Director of Industries a member, but I do not know whether that proposal has been accepted.

29559. To what do you attribute the fact that, whereas before 1899 there was famine and scarcity, there has been none within the last 25 years? Have you grown more food? I will put the question in a leading form. Is it not due to the fact that more money crops are now sown than before?—Yes, and there has been irrigation too.

29560. Irrigation has not materially increased the food supply, if you will pardon my saying so. Is it not due to the fact that money crops have been grown with the result that the people have money in their pockets with which to import food from other Provinces, and, owing to the extension of railways they have the means of importing?—Yes.

29561. To what extent does the Imperial Bank help you?—We have a cash credit of 4 lakhs with the Imperial Bank.

29562. On what security?—On the security of pro-notes of primary societies endorsed by the Central Bank.

29563. If you got 50 lakhs from the Imperial Bank on the same security, could you utilise it?—Not at present.

29564. To what extent could you utilise it?—At present we find that the money we have is quite sufficient for our requirements.

29565. You have sufficient money to meet the demand, and yet you say people often go to the moneylender as well as to you?—Those societies are not working very well, and therefore they are not being financed by the Central Bank.

29566. You could not utilise more money from the Imperial Bank if it were advanced to you on the same terms, at 5 per cent or 1 per cent above bank rate?—I could utilise some but not very much.

29567. To what extent could you utilise it?—At present we have got a surplus of 18 lakhs in the Provincial Bank.

29568. What fees do the Directors get for attending meetings of the Central Banks?—In a great many banks they get some allowance; in other banks they get nothing.

29569. It is honorary?—Yes. In some banks they get travelling allowances, their actual expenses and Rs. 2 or Rs. 3 a day, but that is so in very few banks; generally it is all honorary.

29570. *Sir Thomas Middleton:* When you were a student, did you pay special attention to the study of economics?—Yes, economics was one of my subjects.

29571. One often hears it stated that Indian agriculture suffers from growing industrial crops rather than food crops. You have had exceptional opportunities of seeing the position in this Province and I would like to hear what your view is. Have you seen any indication of agriculture having suffered because industrial crops are grown at the expense of food crops?—I do not think I have seen any.

29572. You have seen no indication of that? On the other hand, in this Province do you find that where industrial crops are grown the prosperity is greater?—Yes.

29573. When sales on commission are made by the cotton selling society to which you referred, is the rate charged the same as that charged by private agents?—The same.

29574. Then why do non-members make use of your society?—Because they feel they will get honest weighment and fair assessment of deductions; but they do not get any rebate afterwards.

29575. You told us you had seen a good deal of these two cattle societies which failed in the Raipur district. Can you indicate in any more detail than you have done in your note what were the reasons for failure? You say lack of interest, but that is a general statement. Do you think there was anything wrong with the rules adopted by the society?—I think so, to the best of my knowledge. I think the site selected was not very suitable.

29576. Unsuitable from the point of view of the stock or of the district? The district is one which has very poor cattle?—What I meant by the actual site was that I think there was some difficulty about fodder also.

29577. You are thinking of the actual site, the headquarters of the society?—Yes, that is what my recollection is.

29578. You state that a good deal of grass land was provided on favourable terms? Was it grass land which was useless?—No, it was not worthless grass land; it could have been used as fodder if cut in time; otherwise it was useful for thatching and other purposes. But I do not think that was the main cause. The members themselves were malguzars and resided about 12 or 13 miles away from the headquarters of the society.

29579. *Dr. Hyder:* Is it correct to say that the co-operative movement in the Central Provinces is weak in these two points, namely, defective organisation and defective education of the members? Are those the two main weaknesses of your movement here?—Yes.

29580. Take the point of education: what staff have you got below your Circle Officers or Inspectors? You have got only three?—We have got three Circle Officers and a Deputy Registrar. Below them we have got 35 Government Auditors.

29581. What provision do you make for the training of these people?—So far they have not been regularly trained, but for the last two years we have been holding training classes for them every year.

29582. For how long do they last?—About a month.

29583. Do you know that they devote 15 months to them in the Punjab?—Yes.

29584. And that they have as many as 15 books to study?—Yes.

29585. Do you know that they have to familiarise themselves with law and rural economics in the Punjab?—Yes. But that is for people who are newly appointed; I am talking of the people who are already there and are required to take a sort of refresher course. In the case of a new Auditor, we do not put him into the actual work until he has taken a six months' course.

29586. Do you recruit from the graduates of the Agricultural College at Nagpur?—No.

29587. Do you not think that it would be desirable to have such recruits in your department?—Yes, I am thinking of that.

29588. With regard to the matter of liquidation, would you not enforce the principle enunciated by the Maclagan Committee of contributory unlimited liability so that an equal *pro rata* rate, levied from the rich and the poor, would help the cause of co-operation in this Province?—Yes.

29589. I understand that you are the final authority for sanctioning the liquidation of any particular society?—Not to sanction the liquidation, but only to cancel the registration.

29590. Who sanctions that? Who takes the initial step?—To cancel the registration of a society I do.

29591. Would you not like the liquidation proceedings to be taken away from the hands of these pleader liquidators and such like people and made over to the Deputy Commissioner of the district?—I do not know how far that would be feasible unless the Deputy Commissioner had an additional staff. With his present staff he cannot possibly undertake liquidation. Of course, a Tahsildar may be entrusted with one or two liquidation cases, but where there are a large number of cases he would never be able to deal with them. In Chhindwara, we had a large number of cases and the Circle Auditor had to tackle that job.

I am asking you this question because I understand that conditions in the Central Provinces and the United Provinces are similar, and there was a committee which went into the whole question and recommended this measure. Do you agree that the conditions are more or less similar to those in the United Provinces?

29592. To proceed to another matter. Have you got any caste societies based on caste panchayats here?—No.

29593. What is the composition of the population of your villages? Are they tribal villages or are they mixed?—They are not always tribal; they are really mixed. Of course, in certain tracts there might be Gond villages entirely.

29594. It seems to me that you have got here a certain moral fibre which you can weave into your society?—In Mandla, for instance, we have got Gond societies. We have not specially organised these societies for the Gonds only, but because they form the predominant element of the population of that district we have formed these societies. We have not specifically used the caste organisation for co-operative societies.

29595. *Prof. Gangulee:* What education have the local instructors had who work under your co-operative institutes?—They have all been recruited more or less from the present staff of banks.

29596. What salaries do they draw?—The local instructors in Berar draw from Rs. 35 to Rs. 45 or Rs. 50 and in the Central Provinces they draw Rs. 40 I think.

29597. Do they sit for any departmental examination before they are appointed?—No.

29598. A reference has been made to co-operative methods in other countries. Would you agree with me that while State aid is necessary, the stimulus in the co-operative movement must come from the people?—The impulse for working co-operative societies on proper lines must come from the people.

29599. Examples of Ireland, Italy and other countries bear out that fact, do they not?—There must be self-help from within.

29600. *Mr. Calvert:* Under this unlimited liability system in societies under liquidation, have there been cases in which a member called to pay his contribution, not his debt, has had to sell or encumber his land?—In certain instances, that has been the case.

29601. Have those cases been at all frequent?—Not frequent I should say.

29602. Would you say there were about a dozen cases in the Province?—There might be more; I cannot say off-hand. There might be two dozen cases at the most.

29603. Those are cases in which the losses have exceeded the reserve funds?—Yes, because the reserve fund is taken first.

29604. And then the personal securities are called upon?—Yes.

29605. Of the actual borrower?— Yes. But in many cases one member may be the surety of one or more members, and in practice the responsibility of sureties is not enforced always because they are all inter-linked.

29606. So that you have had cases in which the reserve fund has been too small for the losses and there has been no paid-up share capital?—Yes.

29607. And when the personal sureties have not been able to pay up, you have had to fall back on individual liability?—Yes.

29608. Has that resulted in any inequality between those who had land to encumber and those who had not?—I think so.

29609. There have been actual cases in which a man has been penalised because he happens to have more property?—Yes; I know of some cases.

29610. Are these cases very rare?—I can think of only 4 or 5 cases.

29611. *The Chairman*: If you know of 4 or 5 cases, is it not quite possible that there may have been 40 or 50? I am trying to get from you what your figure of 4 or 5 really means?—Yes, that is possible. I am only speaking from recollection.

29612. Is it likely that there are a great many more than you have heard of?—There might be about a dozen.

29613. Is that the sort of figure that you expect to find?—It may be that in the course of liquidation many more cases might come up; I am speaking only from my own personal knowledge.

29614. *Sir Henry Lawrence:* Are the clerks and Auditors paid at a rate which will ensure honesty and intelligence?—I think the rate is adequate to secure honesty so far as the Government Auditors are concerned.

29615. And intelligence?—They seem to be all right for the routine work. I should like to have their pay increased in order that we may have a better type of man.

29616. *The Raja of Parlakimedi:* Do any of your societies in rural areas take up education or village sanitation?—No. I know of one case only where a village society inserted a by-law laying down that every member shall send his boy to a school. That is about the nearest approach I can think of.

29617. As regards sanitation?—No. I have, however, known of a society which has sometimes given a contribution for the purchase of quinine. As a matter of fact, I know of two or three cases of that nature.

29618. Has any attempt been made to supply improved implements or seeds?—Not by the society as such, but loans are advanced for the purchase of implements, and I know of a society in Nagpur which is going to purchase some implements jointly on behalf of the society as such.

29619. Do not societies undertake to get seeds from agricultural farms and try to distribute them among their members?—We have got some special seed societies, but societies as such do not jointly take seed from agricultural farms. But we have separate seed societies. They are really branches of the credit societies; their credit and seed business is kept separate. We have got 65 societies like that.

(The witness withdrew.)

The Commission then adjourned till 11 a.m. on Friday, the 21st January, 1927.

Friday, January 21st, 1927.

NAGPUR.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. *(Chairman).*

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.

Sir JAMES MACKENNA, KT., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

RAJA SRI KKISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. B. S. KAMAT.

Mr. C. U. WILLS, I.C.S.

Sir SHANKAR MADHO CHITNAVIS, KT., I.S.O. } *(Co-opted Members).*

Mr. J. A. MADAN, I.C.S.

Mr. F. W. H. SMITH. } *(Joint Secretaries).*

Mr. R. G. ALLAN, M.A., Principal, Agricultural College, Nagpur.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (*i*) *General features.*—Research and investigation may be classed as—

(1) General, in that it is directed towards the improvement of the main staples of the country or in as far as it relates to the solution of soil, nutrition and like problems, which provide a more accurate appreciation of the condition under which the cultivator works.

(2) Local, in that it is directed towards the betterment of crops of more restricted growth or deals with the local problems peculiar to a Province.

Financing.—The first of these should be financed by or assisted in their finance by the Central Government. The second, together with agricultural education and agricultural extension, should be direct duties of Local Governments.

I do not wish to imply that Local Governments should not be expected to finance work in the first group. This they should certainly do. Indirectly their expenditure under extension would form a part of the general scheme, of which the final goal is the betterment of the cultivator.

I feel, however, that research and investigation are absolutely essential in the first group and I do not think that all Local Governments, partly on account of lack of funds, partly from a lack of appreciation of its importance and partly as the outcome of the play of party politics, can be counted on to realise the importance of such research work and may thus be unwilling to find the staff and the money for objects in which they may be unable to see an immediate cash return.

The first group should be financed from a central source.—

(*a*) because they are subjects of interest to the welfare of the country as a whole;

(*b*) because Local Governments cannot, for the reasons given above, be relied on to carry out their part of a general scheme of research and improvement;

(*c*) because the mere fact that the Central Government was in a position to help those who desired to help themselves would itself stimulate local endeavour and a willingness to co-operate in any general work.

Organisation.—The constitution of a comparatively small, central body under the Government of India consisting of the Minister for Agriculture (which should be a separate portfolio, the Agricultural Adviser, certain officers selected by Government and the Presidents of the Committees noted below. The duties of this body would be the allocation of funds to the Crop and Research Committees and offering advice to the Government of India in matters relating to agricultural enactments affecting export and imports or legislation dealing with agricultural interests affecting the country as a whole.

It should in no way seek to dictate to Provincial Governments.

Its working funds could be secured by the levy of a small export cess, ranging from one anna to four annas per cwt., in accordance with mass of the export and the intrinsic value of the article, on wheat, rice, oil-seeds and cakes, fibres (exported or locally worked), hides and bones.

The annual income derived from the above would be controlled by the Central Body and would not be subject to lapse, if not entirely spent in any one year. Its distribution would be governed by the amount of the income provided by each crop cess, by the general importance of the crop to the country and by the character of work in hand.

Co-ordinated in this Central Body and represented therein by their respective Presidents should be a number of Sectional Committees, dealing with the following wheat, paddy, oil-seeds, fibres, animal nutrition and improvement and miscellaneous scientific research. Each of these with the exception of the last should, as in the Indian Central Cotton Committee, consist of experts, growers and the trade from each Province interested in the particular section. Its functions would be—(*a*) the provision of direct research facilities, (*b*) the rendering of assistance to Local Governments either by the provision of special experts, the provision of increased staff under a Provincial Government expert or the financing of sound Provincial schemes, and (*c*) investigation in marketing and export problems. Its working funds would be provided by the Central organisation and the funds allotted would be the property of the Sectional Committee. Each committee would be directly advisory to Provincial Governments in matters relating to its own section and would co-ordinate the work in progress in each Province. In view of their control of funds, there would be a greater tendency to accept their advice and suggestions.

I am of the opinion that the institution of the Indian Central Cotton Committee with its own income has done a great deal to stimulate the improvement of this crop in several directions and that the work of the Coimbatore Cane Breeding Station, another example of centrally financed research, is affecting a striking improvement in sugarcane. I would press for somewhat similar developments on like lines in other important crops and lines of research.

A Central Advisory Board of Agriculture or Central Advisory Crop or Research Committees are likely to be valueless, unless supported by funds over which they have the entire control of distribution.

(*b*) (1) Plant breeding and botanical research has been hampered in this Province by lack of expert staff. It was decided some years ago that at least two Botanists were necessary. This Province only had one up to 1925. The existence of two at present is the outcome of the constitution of the Indian Central Cotton Committee, who meet the pay of one of these.

(2) No real investigation or progress has been possible in horticulture, fruit and vegetables in particular, for lack of expert assistance. The only man with any pretentions thereto was axed by the Local Government after the Reforms were introduced.

(3) Soil investigation.—Practically no work has been possible on soil physics in the absence of staff and equipment.

(4) Agricultural implement investigation.—The appointment of an Engineer is only recent and this officer has since resigned on account of the unsatisfactory conditions of this service. The shops and outfitting generally are of make-shift character and money has not been available for the class of work which this most important branch of investigation demands.

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(*c*) (1) Soil physics, in particular the factors governing tillage operations.

(2) Agricultural engineering, implement design,

(3) Oil-seed crops generally, conditions controlling growth and yield and quality improvement. Except for a certain amount of selection in linseed and ground-nut, there has been but little field attention given to this important group of industrial crops.

QUESTION 2.—AGRICULTURAL EDUCATION.—In answering the questions given in this part of the Questionnaire, I have divided agricultural education into four sub-sections—

(*a*) Collegiate or advanced.

(*b*) Vocational or designed as a finishing course for boys who have completed some form of general education.

(*c*) Pre-vocational or conducted as part of rural school general education.

(*d*) Short course or specialised adult training.

My personal belief is that a real demand for agricultural education in any form will only be evident, after the landowner and the cultivator realise that there is something to be gained by improved methods and that it will benefit their sons to learn these. In other words, the most effective form of agricultural education in its widest sense at present is active demonstration and extension work among the adult agricultural population, impressing on them the value of a change in practice, inducing a higher standard of living and providing the cultivator with the wherewithal to pay for a better education for his children. Twenty years ago there was no Agricultural Department worth describing and education of (*a*) type attracted men seeking Government service only, men often too poor to go to an arts college, men who more often than not had to be subsidised to come and certainly men who had not the land or the capital to make such an education pay; while attempts at (*b*) were an entire failure, the malguzari class of that day being recruited under official pressure and under the stimulation of the hope of securing some minor billet at the Tahsildar's Office or the like. There was not a vestige of popular enthusiasm.

At the present day, extension work has advanced very considerably. Though many seek collegiate education with the intention of securing employment, the percentage attracted by a scholarship is much smaller and the number who seek such education for itself and who possess the wherewithal to apply their knowledge is increasing. At the same time, the value of forms (*b*) and (*c*) is beginning to attract attention in the more agriculturally advanced parts of the Province.

(i) (*a*) Yes. (*b*) and (*c*) can be met as demand now stands, but in any form of an extension of (*c*), in particular, the greatest difficulty would be trained teachers.

(*d*) Can be met on Government farms and on the College farm. The principal short course demand is in Agricultural Engineering in tractor and oil-engine instruction.

(ii) At its present rate of growth, the Agricultural College will have to be extended. This, however, does not imply increased building, except in the hostel, as the removal of the College of Science, which takes one wing of the Agricultural College building would provide this.

There are indications that the class of pre-vocational education now in force at Hoshangabad will cause a demand for like schools in that area. The existing school requires considerable extension.

(iii) I do not think that a strict recruitment from agricultural castes is essential though, on the whole, teachers recruited from rural conditions would be preferable to town bred men. The Agricultural College seldom accepts would-be students who are of city up-bringing as these but rarely take kindly to agricultural work and conditions.

(iv) At the present day, there is a distinct increase in the demand for college education, the outcome of University affiliation. There is also an active demand for the pre-vocational course (middle school) now given at Hoshangabad. At both these, the attendance is as numerous as can be expected and would be greater with more accommodation.

Attempts at education of type (*b*) have to date failed to attract the class for which it is organised. The father who appreciated education wished his son to go further than these permitted. The father who did not had still to learn that agricultural improvement

provided anything concrete and had in consequence more use for his son as a labourer. One of these schools was converted to type (*c*) and the other, which was in a generally backward area, was closed.

(v) This question is difficult to answer.

At present, there are only two living centres of agricultural education. Those referred to use the College and middle schools. In the former up to the present the majority seek education so as to secure employment (Government, if possible), though the number who do so with the intention of private application later is increasing and a certain number of the younger men are undoubtedly induced to seek employment so as to get experience and with the hopes of settling down later on their own land.

With an increasing demand for admittance to the College the tendency is to select men who have the land and capital to make them independent of service, should this not come to hand.

In the latter case, the school as at present constituted, has not been going long enough to state what happens after, but a reasonable number undoubtedly will go back to work on their home farms.

(vi) Yes.

(vii) I do not think so in as far as the existing institutions are concerned. As noted above, courses for middle school boys with a predominance of agriculture and courses of purely agricultural character for boys who had completed this standard of education have not proved popular ; but I do not think this was caused by an unsatisfactory type of course.

(viii) (*a*) *Nature study.*—I regard as an excellent opening for the younger classes of rural schools ; but its value is very closely associated with the personality of the teacher. It is difficult to teach well and unless well-taught it is not of much value. The type of teacher available is poor and is too dependent on memory and the text-book. Many years ago, I outlined a course of nature study for the Education Department on the lines I had at one time used in England, but it could not be carried out for lack of teachers of sufficient quality to instruct.

(*b*) *School plots.*—The school plot of about one to two acres area, if properly managed is, I think, large enough for all the agricultural work, which a rural school time-table would admit of and which boys of that age are capable of working.

It can be designed to provide nature study material for the younger classes and instruction in the character and cultivation of the best local crops and can afford ample practical work of a character within their physical capacities. The best of these in this Province is at Rajnandgaon. It is in many respects like the type illustrated at Poona, during the Agricultural Show, though originated locally. The chief feature here is that the class is voluntary being done out of ordinary school hours and only the sons of agriculturists are privileged to join it. One of the masters manages the area and agricultural training is given by an Assistant of the Agricultural Department. Bullocks and labourers are employed to do the heavier preliminary tillage. Successful school plots, like nature study, demand the personal enthusiasm of a master. In order that teaching should be effective, such a master should receive a couple of years' training at the Agricultural College.

(*c*) *School farms*—I do not think these are suited to rural school needs and conditions. The term implies a fair area, five acres at least and the maintenance of livestock. It also demands more management ability on the part of the master and is hence more open to failure. Agriculture on this scale appears to me to be out of place in an ordinary rural school. A school farm in my mind is to be associated with a place giving definite vocational training to boys after the middle school is completed. In this Province, this could be best managed on existing Government farms if the demand arose. I am of the opinion that agriculture at schools should be directed towards giving a boy an interest in rural life, in observation, in studying cause and effect and in the advantages of certain crops and certain methods, rather than in intensive teaching of agriculture as an examination subject. I think the well-managed plot effects this as well and indeed better than the larger scale farm.

I do not believe in teaching text-book agriculture but in training the rural lad to acquire an understanding of what his father does, why he does it and how he might do it. I would prefer it to be regarded in schools as a form of recreation rather than a class room subject—a form of play, stimulated, may be, by prizes, rather than a form of work.

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(ix) The majority of those who have secured a Diploma or certificate at the Agricultural College are in Government service either in the Central Provinces or in other parts of British India or the Indian States. Very few are engaged in other than agricultural work.

Statistics.

Total passed through the courses given at the College since 1906—289

Employment—

In the Agricultural Department, Central Provinces ...	116
In other Agricultural Department in British India ...	23
In Indian States Agricultural Departments ...	44
In other Government Departments in the Central Provinces	17
In other Government Departments outside the Central Provinces	7
In private farming	30
As estate managers .. .	12
In other trades in some cases linked with Agriculture ...	9
Unknown	31
Total ...	289

(x) Agriculture is not popular—

(*a*) Because the annual income is uncertain.

(*b*) Because the standard of living of this class is higher than that of the cultivator and, as farming returns now stand, the middle-class youth finds it more difficult to make a living which provides needs.

(*c*) Educated as he has certainly been in a town for some years, the conditions of village life have no great attraction.

I do not see how it can be made more attractive, unless it can be made more paying.

Till comparatively recently and even now to a large extent, the middle-class youth, who comes to an Agricultural College, has not the capital and land behind him to allow of farming on his own account. The parents who appreciate education are not usually the more influential cultivators and resident malguzars whose sons might have the means to apply their agricultural knowledge gained at College. To a considerable extent, those who see a value in education are landless or have insufficient outlet in this direction.

(xi) Considerable attention is given to practical and technical ability at the college. This is, however, limited by the other demands of the course. One of the chief difficulties in really equipping youths is the absence of well-run private farms, as those found in England, on which a college trained student can work under a capable man after completing his course of study. The only way this difficulty can be met is by the inclusion in the departmental cadre of an increased number of probationary posts possessing no claim for permanent appointment. These would allow of the inclusion of more passed students for a couple of years training on Government farms and thus fit them better for private farming or as managers.

I receive from time to time applications for home farm managers, which are difficult to meet, as in spite of the stress laid on technical ability, students straight from College lack the experience required.

(xii) The education of the adult agriculturist is a matter of persistent demonstration on the part of Agricultural Assistants. A flying visit however attractive has but little if any lasting impression. Frequent lantern lectures, preferably, cinema, are of assistance.

For accessible villages organised visits by the use of touring motor lorries, effectively equipped would be of value, as these would permit of the staff covering a wider field and visiting a village more frequently.

The education of an adult agriculturist must be largely of practical type, mere talking is ineffective.

I am of the opinion that education generally in rural tracts would be stimulated if parents saw that their children earned something at school, even if it were only two or three annas a week. I was struck by the utility of some of the articles made in village schools as shown at Poona. A larger proportion of time in a village school day

should be devoted to the training of the hand and eye. Children's output whether in the form of plot produce or their manufactures or its cash value should return to the children and hence to their parents as ocular proof of the value of the education.

One of the first steps towards effective adult agricultural education is the encouragement of village or small circle agricultural associations, each owning its own demonstrational plot, where approved methods, better seed and better implements could be demonstrated to the Circle Association members and others. If we can only get some enthusiasm created for co-operative action very considerable advances in many directions would be possible.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) I have stated these in paragraph 87 in the *Memorandum on the Rural Conditions and Agricultural Development of the Central Provinces and Berar* (*see* page 10 above).

(*b*) As outlined in paragraph 89 of the same (*see* page 11 above), I think that the ideal to be aimed at is the formation of small Circle Associations each possessed of its own demonstration plot worked under the guidance of the department. Such plots would greatly facilitate demonstration work and the meetings of the association would induce free discussion and interchange of views.

(*c*) A cultivator will accept advice when he is convinced that it is sound and if it is not likely to involve much capital investment and if it is practically proof against chance of loss. The spread of the use of pure seed is an example. He is also more likely to accept advice, if he has personal faith in the adviser. Some Assistants have a much greater influence than others. It is essential to be certain before giving advice. A bad bit of advice acted on and proved bad has a very damaging effect.

In many cases, the value of technically sound advice is influenced by other economic factors. Deep ploughing may be excellent, but requires better bullocks than the cultivator possesses. Transplanting paddy may be profitable, but fragmented holdings and the consideration of the best use of his labour through the year may cause the cultivator to decide against it.

Improvements which involve capital expenditure are more difficult to introduce. The demonstration plot may show conclusively that a certain dressing of cake or fertiliser is highly profitable, but the cultivator hesitates. I am of the opinion that in cases of this kind it is well worth putting down one or two plots in a village, supplying the cake or fertiliser free the first year, or giving the cultivator a guarantee against financial loss in the first instance.

(*d*) The most striking example of the failure of perfectly sound technical improvement to make headway is the transplantation of paddy in Chhattisgarh referred to in paragraph 108, sub-section (*b*) of the provincial memorandum (*see* page 14 above) in which I have outlined the causes of its failures to make good.

Examples of successful demonstration work affecting agricultural practice are—

(1) Single seedling transplanting in place of bunches, in areas where transplanting already existed. The obvious saving in seed and the greater outturn with no additional cost has helped this.

(2) The marked increase in deeper cultivation and the use of the inversion plough in the cotton tract of recent years—*vide* paragraph 115 (*see* page 17 above). The causes leading to this are intensive demonstration, the introduction of ploughing matches, the fact that the sale of ploughs was taken up enthusiastically by Agricultural Associations and the replacement of the finer model English ploughs by hardier and cheaper, even if more clumsy and less well-balanced, iron ploughs of Indian manufacture. The rate of introduction was also largely aided by plentiful money, the outcome of high cotton prices.

(3) The introduction of line sowing of *kharif* crops in the north-west of the Province in place of broadcasting. The spread of this is, I think, the outcome of intensive village demonstration, aided by the cost of labour, in that line sowing reduced this by allowing the use of hoes, and the high prices of cotton.

QUESTION 4.—ADMINISTRATION.—(*a*) I have indicated this under research. I am of the opinion that the Government of India should aid Local Governments in research investigation relating to the conditions of growth, improvement in yield, and

quality and the marketing and export of the main staples and should finance investigation into the problems affecting general agricultural progress which are not likely to be popular lines of expenditure by Local Governments. I have outlined the organisation I think best.

(*b*) Assuming the organisation outlined, it might be desirable to maintain under the Central Body and paid by the Government of India a certain number of highly specialised experts who could be placed at the disposal of the sectional committees or bureaux as investigation demanded, being utilised by them either at their main research centres or in the Provinces. Some of these could be found among the officers now in the Provinces and appointed by the Secretary of State; but I do not think that Local Governments would favour a wholesale withdrawal of their most experienced officers so as to create a special central corps.

(*c*) (ii) The Railways existing and under construction in this Province, I think are fairly adequate for its present needs.

There are certain anomalies in freight rates, which deserve attention. Cakes declared for manurial purposes are transported at a lower rate than the same cakes to be utilised as cattle food.

(iii) The main roads of this Province are on the whole good, though many are handicapped for use in the rains by being only provided with low level causeways at river crossings. A good deal of improvement in this respect has taken place in recent years. Bridging of high level causeways are however needed on some of the bigger rivers. With the increase of heavy motor traffic on these roads, it will be necessary for the State to spend more on upkeep.

There is a considerable need of secondary feeder roads so as to permit of easier access to more of the villages in the interior. Road communications are probably weakest on the plateau areas, specially east and west.

QUESTON 5.—FINANCE.—(*a*) The principal forms of agricultural finance are seed and the expenses incurred in weeding and harvest of *kharif* crops.

It is difficult to suggest any possible improvement on the source of such loans, until the co-operative spirit takes hold of the cultivator and co-operative societies and Circle Agricultural Associations are living bodies.

The State offers in limited amounts *taccavi* loans for manures, implements, seed and land improvement. These are tangible; the first three can be supplied in kind and expenditure or non-expenditure of a loan in the last case be noticed. In financing crop operations the security of use for the purpose for which lent would be difficult.

I doubt if the cultivator is educated to the use of cheap credit. The easier it is to borrow, the more he tends to misuse the loan and increase his borrowings.

(*b*) The chief objections to the *taccavi* loan, which might be met by Government are—

(1) The delay which occurs between the application for a loan and the receipt of the value of the loan by the borrower.

(2) Rigidness with which payment is enforced without regard to the possibly temporary financial stringency of the borrower at the time at which payment is due. This I realise is difficult in view of the laxness in repayment inherent in the cultivator and encouraged by the *sowcar*.

If *taccavi* as a means of financing agriculture was to be extended, a special officer dealing with these in each district would probably facilitate business.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) (1) Unproductive borrowing to fulfil social requirements.

(2) Financing for seed and crop cultivation and cattle.

(3) Land improvement.

(4) Manures and implements (chiefly *taccavi* through the Agricultural Department).

(5) After years of low crop returns borrowing to meet immediate necessities of life.

(ii) This I have dealt with in paragraph 47 of the provincial memorandum (*see* page 6 above).

(iii) The high rates of compound interest attendant on borrowing, *vide* paragraph 49 (*see* page 7 above).

The fact that the biggest proportion of borrowing is under (*a*) (i) (r), while the surplus cash after meeting the family budget demands is small.

The tendency of the *sowcar* or moneylending malguzar to allow loans to mount up so as to secure a firmer grip on the borrower or tenant.

(*b*) The prevention of an unlimited accumulation of debt. The introduction of a measure like that of the Deccan Agriculturists' Relief Act in these Provinces.

Any attempt to relieve the agriculturists' burden of debt must be accompanied by measures to prevent his accumulating a fresh unproductive debt. Unless this can be done very little is gained.

(*c*) One realises that the right to mortgage land supplies an efficient business farmer with the means to secure working capital; but in view of the fact that the right to mortgage in India would be largely employed to secure a loan for an unproductive cause, it appears doubtful policy to extend the right of mortgage. The majority of tenants are occupancy tenants without such rights. The right to mortgage might be restricted to limitation of this right to the mortgage being effected through recognised or Government controlled land mortgage banks.

A great deal of the poverty and indebtedness of villagers arises from the fact that many villages are held by malguzars who have no interest whatsoever in agriculture and only regard their village and tenants as potential sources of income to be derived from loans made to them. In other words they use their villages to extend their lending business. There is a very great deal of difference between the character of a village where the malguzar is a resident cultivator and a village owned by the absentee moneylending type. The misuse of the malguzari system of tenure (I believe outside the Commission's terms of enquiry) is one of the causes, if not the chief cause, of backward agriculture, slackness, lack of thrift and accumulated indebtedness and the difficulty the department meets in making advance. Any action which strengthens the position of the non-resident land-grabbing malguzar who has no real interest in agriculture as such will be fatal.

QUESTION 9.—SOILS.—(*a*) (i) A great deal of the heavier black soil under *kharif* crops or garden crops, in at any rate the Nagpur district (or areas of 35" rain and over), would benefit by better drainage during the monsoon. The effect of underdrainage on the College farm and elsewhere has been most marked. Experiments in the cheaper form of mole drainage using tractors are being started.

(*b*) (*i*) This can be shown to the Commission on the College farm.

QUESTION 10.—FERTILISERS—(*a*) Yes. In garden and irrigated wheat crops, sugarcane, oranges and cotton.

(*b*) I have not come across much of this; most of the fertilisers, in fact probably all, used in the Province are secured in the crude forms and not made up as mixtures. The only fertilisers used at all by the general public are ammonium sulphate and nitrate of soda.

(*c*) I believe in its liberal use on selected crops and areas at centres, where its use is advocated. In these demonstrations a fertiliser should be supplied free. It represents an example of speculative investment in the cultivator's eye and one which he is not likely to put capital into in the first instance. Such plots should be laid out on private growers' land and carefully watched by the department. A large series of these, using ammonium sulphate, were tried this year.

It is most important that everything should be done to keep down overhead charges and put the fertiliser at the disposal of the grower at its lowest possible cost. In the present year we had in one area of the Province every expectation of a 100 tons demand for ammonium sulphate. The special packing in quantities of one maund and the distribution agency adopted by the company added roughly a rupee per maund to the cost on the previous year's price. The result was a falling off of quite two-thirds of the expected sales.

A rupee per maund may not appear much to a company, which thinks in lakhs but it has a very profound effect on a would-be user, hesitating on the brink of, as far as he is concerned, a considerable capital investment. Rises in price for any cause at the moment an article looks like taking on are fatal.

(*d*) *Karanji* cake for cane in the plateau. The use of other cakes in the Wainganga valley, ammonium sulphate in the nort-hwest of the Province.

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(*e*) No. A good deal has yet to be done. Stated briefly, nitrogenous manures are the most effective and then phosphatic. Potash manures have on the whole produced little result. The paddy crop responds more readily to the general natural manures as cattle-dung and poudrette and to green manuring with or without phosphates. Cotton is best manured by comparatively light dressing of cattle-dung, supported by light dressings of nitrate of soda or ammonium sulphate, applied when heavy rainfall has checked nitrification and washed out the nitrates which are very freely formed in June and early July. Cotton can also be profitably manured by mixtures of nitrogenous and phosphatic fertilisers, but the application of fertilisers on any large scale to cotton is somewhat speculative and depends very much on the character of the season. Wheat, the vast majority of which is sown as a dry crop, does not respond to fertilisers, which are almost invariably applied at a loss.

Sugarcane answers to application of ammonium sulphate applied with cake as top dressings. On certain soils the limiting factor of growth has been absence of phosphates.

QUESTION 11.—CROPS.—(*a*) (*i*) *Improvement of existing crops.*—The work in progress in the department is, I consider, satisfactory, when taken in consideration with the staff which has been and is at its disposal. To get thoroughly effective improvement there should be a Botanist for cotton and fibres and another for oil-seeds, a third for wheat and paddy and a fourth dealing with the improvement of the pulses, fodders and millets.

(ii) *Introduction of new crops.*—There have been several satisfactory introductions of new crops, *vide* paragraph 112 of the memorandum (*see* page 16 above) other than fodder crops. Little or no progress can be said to have been made in these last though a number have been tried. *Berseem* is the best introduction, but is handicapped by lack of cold weather irrigation facilities and cost of seed. Of the seed crops, ground-nut in view of the fall in the price of cotton has the biggest future before it.

(iii) *The distribution of seeds.*—The means at present adopted to increase the supply of pure seed from the stocks available at Government farms are recorded in paragraph 88 of the memorandum (*see* page 10 above).

The ideal would be a central seed farm belonging to each Circle Agricultural Association—the seed of this being in the next year grown by certain members of the association acting as seed farmers and in the following available for seed in the surrounding area.

The original plans on which the Seed Unions of *roseum* were established were similar in principle—a central private seed farm supervised by Government agency supplied good quality seed to a number of seed farmers who formed the Seed Union. On these seed farms quality, it was intended, should be controlled by Union agencies. The present existing number of individual seed farms, many of which are not large, throws too great a stress on the department's supervision. In fact it is doubtful, if the purity of the seed can be properly maintained on a number of these, in particular in cotton, where cross fertilisation and the condition of ginning both tend towards the falling off of quality. On the introduction of a new cotton, steps, I think, will have to be taken to concentrate the new variety on certain blocks of country and even to induce the replacement of existing cottons in those selected tracts by guaranteeing growers against any loss This will be necessary to ensure purity and to permit of the securing of a better price on the basis of staple.

(iv) *Prevention of damage by wild animals.*—Wild animals in particular pig and jackal do a considerable amount of damage to sugarcane, ground-nut and *juari* each year. A great deal of discussion has taken place on this subject.

Pig-killing clubs have been constituted in certain places, though it cannot be said that they have done much. There has been a considerable demand for an increase in gun licences. The issue of licences has in general resulted in the rapid exterminat on of black buck and the like but not of the more personally dangerous pig. The right to kill off pig lying up in forest blocks might help in areas adjoining Government forest, which are undoubtedly open to being severely harassed by these animals.

Cane usually grown in small blocks can be adequately protected by woven fencing and there is a steady expansion in its use.

Another means of defence has recently been developed in the case of ground-nut. At certain places by means of co-operative action all the ground-nut areas of several growers have been concentrated so as to form a single block, thus rendering protection easier and distributing the effect of damage.

It is difficult to suggest or enforce means of protection, unless some spirit of self-help and co-operation is in evidence. The villager recognises the cause of damage, but is as untrained in taking co-operative action against a common foe as he is in any other kind of organisation demanding co-operation. Given co-operative action, I am of the opinion that any of the wild animal pests would be held in check.

(*b*) The only heavy yielding food crop which will grow in these Provinces and is not grown is cassava. It is probable that the difficulty accompanying extraction and preparation as compared with the grain crops tells against its wider use in India.

(*c*) These have been recorded in paragraphs 112 and 113 of the memorandum (*see* page 16 above).

QUESTION 12.—CULTIVATION.—(*i*) Greater depth of primary cultivation is desirable in particular in *rabi* crops and to some extent in garden crops. In *kharif* crops depth may result in delayed sowings and in the absorption of too much rain in the environment of the seedling. Apart from its definite need in land infested with *kans* or *khunda* it is less essential under rain sown conditions. Cultivation to a depth 6" to 7" once in four to five years in preparation for a late sown crop in the rotation, as *juar* for grain, with 4" to 5" in the other years in preparation for crops like cotton, ground-nut, *juari* fodder or *sann*, in all of which earliness is a factor of prime importance, appears to me to be correct practice.

My opinion is that it is the Indian cultivator's implements and power rather than his system of tillage which are to blame for defects in his seed bed preparation. Another factor, which affects the efficiency of his work, is the character, of the monsoon in his locality. The quality of the cultivation done for the *rabi* crop, for example, in different parts of the Province, is closely associated with the rainfall and the number of working days in July and August.

The cultivator in a *kharif* area realises that though he may be satisfied with 4" cultivation as a general rule deep work at intervals is necessary, but till recently the only implement he had was a ponderous wooden plough requiring 3 to 4 pairs of bullocks and doing but little in a day and in consequence he restricted depth cultivation to about once in 10 to 12 years.

A cultivator in a *rabi* area realises that a fine mulch 3" to 4" deep is desirable for his wheat, but in an unfavourable cultivation season he cannot attain this with only the country plough or *bakhar* to aid him.

A common defect of *bakhar* cultivation for the *kharif* crop is the provision of too fine a surface soil and in consequence a tendency for the rains to consolidate the surface, creating, if drying, a crust, which handicaps germination, but with only a *bakhar* (bladed harrow) at his disposal, it is difficult to avoid this defect in preparation.

The improvement of the implement at his disposal is not an easy matter, as on account of the smallness of his holding and the low duty thereby derived from several implements utilised for different jobs, he is not in a position to invest economically in implements which by reason of their functions would help him to overcome his seed-bed defects.

(ii) The value of rotation is, I think, realised and, when not applied, the non-application is governed by some climatic or economic factor. Thus in the paddy tract the only possible main crop on large areas is paddy and here, where the soil permits, the cultivator takes a catch crop, more often than not a pulse. In the wheat tract wheat often goes year after year on the same part of the field and pulse on another. The reason they are not rotated is that at the close of the rains the first-named area becomes workable first and in consequence the mulch needed for wheat is procured. The area given to gram remains wet, and the cultivation which can be given is in consequence coarse and unsuited to wheat Over wide areas of the wheat tract, a mixture of wheat and gram is common and in others the crop rotates with pulse and linseed.

In the cotton tract, the value of cotton over other crops has been so marked that there has been a natural tendency to reduce the character of the rotation and concentrate on a larger percentage of the money crop. With the fall in the price of cotton and the expansion of ground-nut, it is probable that a return to a more sane rotation embodying cotton, *juar* and ground-nut will be in evidence.

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QUESTION 14.—IMPLEMENTS.—(*a*) and (*b*) This is in part dealt with in paragraph 99 of the provincial memorandum (*see* page 13 above). Few implements of Western manufactures to-day are suited as they stand to Indian needs, even the needs of the relatively large farmer. The present inclination is to invite the Indian agriculturist to step over the last 150 years of steady evolution in machine development and machine sense, and to expect him to welcome and to use effectively a product of the nineteenth century invented and fashioned to different economic conditions. Many of the features of even the plough are additions to speed its working or to make it easier to handle. They have their advantages but they add to its price and increase its delicacy and are open to misapplication by the novice without affecting the essential value. The same may be said of a modern bumper disc harrow and other implements.

The Indian farmer who has sufficient land on which he can economically employ the several specialist implements of Western farming, require in the present state of evolution of his workman and himself strong and simple and cheap (because they are simple), implements embodying the essential tillage features of their types, but devoid of anything which increases delicacy and cost, even though in the hands of an expert such may increase efficiency in actual handing.

I do not think that the majority of British and American agricultural implement manufactures have really studied the needs of the East.

Further the great mass of Indian farmers are small holders, who, even if they were provided with cheap capital, have not the opportunity for the economic employment of several specialist implements on their holdings. In their case the only suggestions I can offer are—

(*i*) Concentration on Indian implements so as to add to their working efficiency and capacity of being altered by the owner to meet the varying demands he has for his general purpose implements.

(*ii*) The production of strong and simple implements on Western lines which are capable of being altered by changes of attachment to plough, cultivate, harrow and hoe, on the Planet Junior principle, but stronger and if possible simpler.

At present we attempt to hasten the adoption of improved implements by active demonstration in the villages and giving *taccavi* loans. Reference to the memorandum will show that the rate of progress has been considerable in recent years. I can only suggest an increase in staff to forward the first line and an expansion of *taccavi* to permit of the necessary purchases.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) My opinions are given in the scheme for the improvement of cattle-breeding and livestock in this Province, which has been placed before the Commission. *

The chief defects from which Government stock-breeding has suffered in the past are—

(1) Small scale enterprises on, for the most part, unsuitable areas.

(2) Lack of definite policy in existing herd-breeding and continuity of control.

(3) Lack of appreciation of the exact character of the stock which local economic needs demanded.

(4) Attempts to maintain local breeds or improve on local breeds of no outstanding merit.

The policy I advocate is—

(1) Large scale pure breeding at five good centres, using the existing areas attached to seed and demonstration farms as young stock-raising centres and thus potentially increasing the main breeding farms' capacity.

(2) The utilisation of pure bulls of the selected breeds to grade up local stock, taking up extensive tracts of forest land for these herds. For the first three to four generations, the output of these would be bullocks, but eventually they would provide high grade bulls up to a sufficient breeding purity. By a combination of the above, it would then be possible to provide good bulls by hundreds instead of tens as at present, and it would be possible to replace existing scrubs village by village over considerable areas, raising the whole standard of a district.

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* *Vide* Appendix, pages 211—219.

At present Government herds produce about 40 or 45 reliable bulls per annum. There is no difficulty of disposal, specially under the premium system, but these are scattered over a very wide area and their obvious influence in general improvement is small.

(ii) The betterment of the milk industry in particular near bigger cities rests entirely on the betterment of the milking stock. This is included in the breeding policy referred to. The great majority of the cows kept by city milk vendors are uneconomic producers. These stock owners only make their business pay them by feeding their herds by trespass, by keeping them under wretched conditions and by adulteration of the milk. It may be noted however that adulteration is also the only way of making an entirely inadequate milk-supply go round and that the amount of water added bears a fairly close relation to the quality which the buyer requires and is willing to pay for.

The removal of the milk business from the centres of the cities to the suburbs would improve the conditions of milking. This can best be got by stricter penalties on illegitimate grazing. But it would not increase the supply, though, by cheapening the cost of production, it might slightly reduce adulteration.

Co-operative enterprise, in which in the earlier stages Government co-operation is essential, would certainly improve matters.

The Telinkheri dairy is an example in this respect A considerable amount of nursing and pressure was required in the earlier days to educate the *gowlis*. The society is now flourishing, the chief contributing factors being the possession of better yielding stock and cheap wholesale purchase of supplies.

(*b*) (i) The overstocking of common pastures is greatest where grazing is commonest, in particular in Chhattisgarh. Here there are vast herds of entirely useless and uneconomic cattle, which because of this and in spite of their numbers fail to supply even the working needs of the village. The evil is the outcome of absence of restriction on the number of head a villager may turn loose and the tendency to measure social position by the number owned rather than their quality. The real reason for the maintenance of their apparently useless stock is their production of dung to be utilised as fuel.

The area is distinctly backward and it is difficult to imagine the control of grazing on the village areas and the limitation of stock as the outcome of the village panchayat or co-operation. Nothing short of State action limiting the head to be kept on the village common and regulating the number to the acreage farmed is likely to stop the evil.

(ii) There has been steady reduction of the area under grass which used to lie between fields, specially in the cotton tract. This has reduced grazing considerably. The reduction of the area of this fallow land could be neutralised by an increase under *juari*. Though the total area under *juari* in the cotton tract is greater now than, say, 40 years ago, the percentage of total cropped land under this crop is less, in spite of the larger number of plough-cattle than of old required to cope with the extended cultivation of the present day.

This position has undoubtedly been partly met by a limitation of livestock numbers to actual needs and possibly by an increased use of the Melghat forest grazing areas.

The high price of cotton has stimulated the use of the land made available by encroachment on these head-lands for the extension of this crop. With its fall will come a fall in cotton areas, an increase in *juari* and hence a balancing of the grass shortage by ampler crop residues.

(iii) There would be ample fodder of this kind were there fewer useless animals. The chief trouble does not lie in the quantity of fodder, but in its uneconomic use by valueless cattle.

(iv) It is unlikely that this can be remedied on any wide scale. Their growth demands irrigation facilities and these are only likely to be limited. The extension of ensilage, using grasses in certain tracts and *juari* fodder in others would be a more likely solution. We have still to prove however that the growth of an area of *juari* on a holding and its harvest and conversion to ensilage is as economic a use of the land as the growth of *juari* for grain and the feeding of the livestock on the *karbi*.

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Succulence is more essential in a dairy industry than in the feeding of work stock, specially the work stock of India with their relatively high digestive capacity.

(*d*) The forests of the Central Provinces can supply a very large amount of cut grass as witnessed by the amounts baled and exported during the War without any effect on the local demands. It is not a question of absence of such stocks but the fact that, as many areas lie at long distances from these forest areas, the cost of transport becomes heavy and could only be profitably paid under exceptional conditions of shortage or if livestock became more valuable.

(*e*) Among the really keen agricultural landowners there is an increasing interest in stock improvement. The difficulty of extending this interest lies in the fact that a large percentage of the bigger landowning class take no interest in agriculture of any kind, let alone stock-breeding.

It is only of recent years that the rise in the value of work stock has drawn the attention of landowners to the necessity of protecting their agricultural interest by raising their own stock or to the possibilities of an income from the production and sale of good bullocks.

Question 18.—AGRICULTURAL LABOUR.—(*a*) and (*b*) The provincial memorandum in paragraphs 25 to 31 deals with the position in this Province. (*See* pages 3 to 5 above except paragraphs 29 and 30 which are not reprinted.) The rice and plateau tracts have a surplus labour population. In other tracts it is short specially in the cotton tract.

There is however a fairly free seasonal migration, attracted by the better wages offering from the rice and plateau areas to the others I do not think any special measures are needed to attract this labour. As time passes and the disastrous effect of the influenza epidemic wanes, matters will improve.

A factor tending to the shortage of labour in the cotton tract is the tendency of comparatively small holders to utilise the wealth accruing from cotton in doing less physical work on their holdings and employing outside labour, thus increasing the demand on a limited supply. The fall in the price of cotton will, I feel certain, result in an increase of available labour and a fall in wages.

(*c*) I do not consider that this question applies to this Province. There is little really surplus labour population. The plateau population in spite of possessing fairly large areas of culturable land and in spite of the opening up of railway communication, has not materially increased.

QUESTION 23.—GENERAL EDUCATION.—(*a*) (*i*) In my opinion, advance in agriculture in this country depends on the education of the bigger landowners to a sense of their responsibilities as landlords. There are many who have a keen interest in agriculture, but there are on the other hand very many who have little personal interest, in the industry and little or no appreciation of the duties which their position in the State demands. They derive an income from the land, but unlike the tenant and the State supply nothing towards its development. In many cases the evil is even greater; their interest in the ownership of land rests simply in the advantage which their position as landlords gives them for conducting a lending business.

The possession of landlord rights in land even such as the malguzari system permits is historically recent. The personal interest in his land and in his tenants, the love of an ancient heritage which characterises the better class of landlord in England is the outcome of generations of possession. It is thus not surprising that we do not find this interest abundant in India and that the spirit of the tax collector still influences the malguzar landlord of to-day.

I regard University education and higher education at the Agricultural College as the principal means by which this end can be attained. I supported the affiliation of the College with the Nagpur University chiefly because I hoped that its ability under the University to give a degree with the status this carries would alienate the sons of such men from arts and law and attract them to a form of advanced study in keeping with their position in the State.

An Agricultural College under a University should cater for the needs of three groups:—

(1) The bigger land-owners' sons, the future leaders of rural life, or men desiring to be trained as estate managers.

(2) Students seeking to secure a more scientific knowledge of agriculture with the intention of future investigation, teaching or employment in some line of service—Government or otherwise—in which such knowledge will aid them.

(3) The sons of bigger farmers or would-be farm managers whose need is a better practical and business knowledge of modern farming and modern means to its achievement.

The first two should be met by the University Degree Courses. The last by two-year courses recognised by the University and conducted either at the college itself or at external centres, but under the general college control, being staffed by men who had experience, gained at the college and in practical farming. As far as the existing college is able, it attempts to cater for the needs of all these groups. The first two under the classes conducted for its Degree Course and the last by means of its two-year Certificate Course.

One realises, however, that the interests of the first two groups are not identical. Both need a groundwork of agricultural technique and a knowledge of sound farming practice and the reasons which govern this; but the first group requires less devotion of time to the direct sciences and greater concentration on land and estate management, agricultural economics in its various phases and in law as related to land than the uniform course now given and the existing staff permits of.

At present as affiliation is but recent, the majority of students are of the second group.

It cannot be said that the two-year Certificate class has attracted as many of the more substantial farming class, as was expected.

(*b*) I am of the opinion that—

(1) Rural primary and middle school education should give greater attention to the training of hand and eye, utilising rural industries and rural life as material.

(2) That all rural middle schools should have their school plots of one to two acres in area and that these should be used to stimulate the boy's interest in agriculture and his personal interest on what goes on on his father's land. I do not favour the inclusion of agriculture in the school curriculum as a class room or examination subject. I would prefer it to be optional or as a recreation stimulated by small prizes, utilisation of plot product or nominal pay for effort given in the school plot. It should be a kind of class to which admittance should be regarded as a privilege and honour.

(3) The more the literary education given can be made to possess an association with rural life without detracting from its educational value, the better. Arithmetic, for instance, might easily be made to suit country needs.
The direct measurement of land—survey—might be utilised with geometry. Simple farm accounts might be included in arithmetic lessons in the middle schools.

Physical geography could be illustrated by what is to be found in progress in any field in the rains and the effects of control and direction illustrated and applied to land management

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) It is difficult to suggest steps to induce men with capital to take up farming.

The chief factors which prevent their doing so are—

(1) Unreliability of returns, unless protected by irrigation.

(2) The difficulty of securing suitable single economic areas.

(3) Lack of agricultural knowledge.

Many invest in land, but very much fewer do so with the intention of farming though, I think, there is more tendency this way than there used to be.

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I would suggest the shortening of the period of service, required in order to earn a pension of men in the Agricultural Service. I think many of these would tend to put their savings into farming, if allowed to retire with an adequate pension, before they were too old. They have the experience which many with capital lack. Such men would prove invaluable on the areas on which they settled.

It might be possible also to afford the sons of men with capital invested in land who intend farming after completing their college courses short time appointments under Government, so as to acquire that detail and business knowledge of farming which only daily experience can provide. These appointments would be on suitable Government farms.

(*b*) (1) Lack of any real interest in the improvement of their estates.

(2) Lack of ability to secure capital at reasonable rates of interest.

(3) Many improvements on an estate or village demand complete rights so as to be effective. Under existing conditions of fragmented holdings and tenant rights any large scale scheme of improvement by the landlord is rendered difficult or indeed impossible, on account of the objections raised and the difficulty of getting various interests to co-operate.

(4) Lack of sufficient knowledge of land development and hence of the best means o carrying out an improvement economically.

APPENDIX.

Note by Mr. R. G. Allan on future cattle-breeding development in the Central Provinces and Berar (*vide* Question 16.)

Types of work.—Breeding may be divided into three distinct types, all of which play their part in the present and future improvement of the livestock of a Province. All must be included to a greater or lesser extent in any policy of cattle improvement.

These types may be classed as—

(*a*) The improvement of existing more or less established pure breeds.

(*b*) The production of new breeds by hybridisation of two recognised types, each possessing particular characters of merit which it is desired to blend into one breed. In this type after the first cross is completed, subsequent mating is made between first generation and subsequent generation cross-breds.

(*c*) *Grade breeding.*—In this form a bull of an established pure breed is utilised on cows of non-descript parentage, scrub, local or country cows. Their only essentials are uniformity of size, healthiness and fecundity. The product of the first cross is known as the 1st grade. The cows of the first grade are in their turn served by another bull of the same pure breed as was originally used. This is repeated with each generation and within 3—4 generations all the stock—male and female—will become exactly of the appearance and character of the breed of the original bull used. This last type of breeding is frankly commercial. The object is to make good work bullocks or higher milk yielding cows. Which of these predominates will depend on the character of the pure breed of the sires selected. It must be noted as an essential that in both (*b*) and (*c*) the males of the first three generations and even longer in the case of (*b*) are not suited for issue as breeding bulls and must be subject to castration. Type (*c*) is, however, a rapid method of getting good bullocks or milch cows and eventually good bulls. It is also easier to manage and cheaper.

The existing position in the Central Provinces and Berar.—At present the department have—

(1) A breeding farm at Garhi which handles the Gaolao breed, the one and only really distinctive breed in the Central Provinces and Berar which possesses any pretensions to what a modern breeder might define as purity.

(2) A breeding farm at Powarkhera which deals with a pure breed—the Malvi—imported from Central India.

(3) Three collections of animals, each on a small scale, at Drug, Bilaspur and Chandkhuri. They are based on Chhattisgarhi stock but there has also been some admixture of Malvi blood. Policy has been somewhat variable and in consequence progress towards the true needs, conditions and environment demands of the tract has not been marked.

(4) A breeding farm at Telinkheri which specialises in Sahiwals. This breed originates in the Punjab. It is pure. The cows are among the best milkers in India but the males are slow moving, heavy and somewhat sluggish animals.

(5) A small breeding centre at Sindewahi. The policy in the past has been somewhat indefinite: but it may be stated to be a herd of somewhat impure Umardha extraction sired by a Montgomery bull. The policy has not been fixed but it may be classed as belonging to the third type (*c*), the recent intention being to sire each generation of grades by a Montgomery bull, thus building up a herd of Montgomery characteristics.

(6) A breeding farm at Bograon. This was originally started with the intention of breeding the Khamgaon breed. The Khamgaon animals though they may possess certain general features which distinguish them from, for instance, what are called the Umardha breed, are not a pure type in the sense as applied to the Gaolao, Malvi or Sahiwal. Several attempts were made to secure a pure bull of the type but these failed. It was at last decided for lack of another type to breed the cows to a Montgomery. The intention was like No. 5 to create a grade herd of Montgomery.

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(7) A small breeding herd at Khandwa. The foundation cows are Nimari or possibly more exactly Nimari-Khergaon, as most of the stock in this tract has been tainted with the Khergaon blood, an emigrant from Indore. These cows are also sired by a Montgomery. The general intention is, what I have termed, grading and as in 5 and 6 the ultimate product would be a Montgomery grade.

(8) At Adhartal a small experimental herd, the product of a cross between the Malvi and the Montgomery. In this case we have something different from (5), (6) and (7) as we are here dealing with the first cros sof two definite breeds, each possessed of some purity and definite character, and not with a bull of a pure breed on collections of semi-nondescript cows of impure blood, as are represented by the Umardha-Khamgaon and Nimari cows at Sindewahi, Borgaon and Khandwa. This small herd is experimental. It is an example of "New Breed" construction and the future bull will be a Malvi Montgomery cross and not another pure Montgomery. It may be possible to combine the solid heavy work character of the Malvi with the milk producing character of Montgomery female in the same breed.

(9) At the College farm, Nagpur, a small experimental herd in which breed making is in progress, mere half-bred Ayrshire-Hansi cows are being bred to a Montgomery bull. In this case strong milk characters exist on both sides and the object in view, while keeping the above, is to combine the quick movement of the cross with the climatic and disease-resisting character of the Montgomery, thus producing a breed of which the males will be quick moving animals, suited to the Indian climate and the females milkers of value.

In this case as in No. 8 the sires to cover the females of the first generation of Montgomery-Ayrshire-Hansi will be from the males of the above combined strain.

We have thus breeding of type (*a*), *i.e.*, establishment of herds of existing Indian breeds of merit in cases 1, 2, 4, at Garhi, Powarkhera and Telinkheri, dealing with the Gaolao, Malvi and Sahiwal breeds. Breeding of type (*b*), the making of new breeds, in cases 8 and 9 at Adhartal and Nagpur and work on the lines of type (*c*)—Grade Breeding—in 5, 6 and 7.

The type in No. 3 has been less defined.

In reference to the breeding farms referred to above the Deputy Director to Agriculture in charge of Animal Husbandry is of the opinion, with which I concur, that the three breeding farms under No. 3 at Chandkhuri, Drug and Bilaspur and those at Sindewahi, Borgaon and Khandwa are unsuited for breeding purposes, as regards size, environment and natural food supplies. We do not suggest that these should be done away with, but that they should act as depôts carrying young stock over a certain age till they are ready for sale sent thence from central breeding farms. It will be no more costly than at present, indeed in some respects cheaper and will certainly add to the efficiency of the work and the number of marketable stock available. The relation of these depôts to the central breeding centres is shown later in this note.

Breeding objects.—In any rational animal breeding, policy it is essential that the objects to be sought should be clearly defined. The object of any breeding is not merely an animal or even a good animal but an animal possessing certain definite characters and able to transmit these characters to its offspring. The power of transmission is dependent on the purity of the bull and increases with each generation of effective breeding. The characters of importance are (1) those which make the animals produced suited to the environment, climate and food supplies of the area in which they live and (2) those which tend to endow them with the form and functions which render them of local commercial value. The climate and environment of different tracts are frequently distinctive. The commercial demands of one locality differ widely from those of another.

Environment and food supplies primarily decide size and ability. A big breed would not thrive under the normal conditions of Chhattisgarhi life. A heavy slow moving type would fail in a hilly tract. A big type is adapted to the plains and an adequate food supply. No breeding policy which overlooked the chief essentials of environment could hope to be lasting in its effects.

This is not however all. Assuming this pitfall to be avoided, the commercial ntility of the animal, the want of the buyer and the object for which he keeps his animals and the type of production which he expects of them, must be adequately met by the

breeder, if the pure breed or the new breed, he desires to introduce, is to prove effective or popular. One centre asks for quick moving bullocks, another desires power and vitality rather than speed and a third seeks to make its money by milk and has thus only a secondary interest in the males of the breed.

It may be possible to provide a dual purpose breed, one in which we find a work characteristic of the desired type in the male and milk in the female.

The fact however that the female gives milk while the bullock is slow and heavy would not satisfy the rural farmer whose money depended on the speed with which his work at certain seasons could be done. A dual purpose must not merely provide milk and work; but it must be the right type of work.

To the dweller far from the city the utility of the bullock for his work is a much more important feature than the milk capacity of the cow, however valuable this last asset may be.

The value of seeking improvement from outside.—Because a certain breed or animal or collection of animals of roughly similar type is found in a certain area, it does not imply that they are for that reason the best or the most commercially valuable type for that particular tract, though they may provide evidence as to what the climate will allow or the direction to which the commercial needs of their particular locality tends.

The improvement of local stock of low purity value from within itself is a very slow process.

The cattle population of the United States, the Argentine or Australia would not be what they are today had their stock breeders attempted to work up the local breeds without resource to other countries for pure stock of known value.

Much more rapid and effective results are usually obtained by the introduction of a breed which suits the environment and fulfil local commercial needs, but which is brought in from another area where purity has been arrived at by more careful attention to the art of breeding and by using bulls of this breed to grade up the local type to the higher standard of the introduced breed.

This is I consider the quickest method of improving the majority of the Central Provinces and Berar stock. The cattle population of the Province like the human is largely emigrant in origin. Very little except the Gaolao breed has any pretensions to purity of extraction.

Specified needs in cattle.—Rural Berar and Western Circle—

(1) activity and rapidity of action.

(2) increase of size and weight to meet the general tendency to deeper primary cultivation.

(3) milk in the female as making her worth better care and increasing her ability to nourish her calf.

Rural North Central Provinces—

(1) capacity for heavy and deeper cultivation. Strength and ability to pull more essential than speed.

(2) milk if procurable.

Rural Southern Circle, Nagpur Division, and parts of plateau:—

(1) quick movement with some increase in body weight.

(2) milk if procurable.

Chhattisgarh.—A small hardy, well muscled male suited to the condition of the particular climate and food supplies.

Urban and semi Urban areas in any of above—

(1) higher milking cows.

(2) working males, type not so important but tending if possible to the particular rural needs in its own tract, as providing a better selling animal.

Specified needs in breeding centres.—These may be classed as threefold—

(1) They must be sufficient in area to provide for herds of large enough numbers so as to yield a corp of bulls per annum which will admit of distinguishable improvement on the stock of the locality.

(2) The conditions as represented by climate, water facilities and grass of fodder supplies should be the best procurable, so as to admit of full development and to secure the full advantages of the actual processes of correct mating and selection.

(3) The production of the stock should not entail unnecessary overhead charges, the common defect of small undertakings.

The existing conditions in relation to these needs.—(a) *Cattle.*—It may be stated that no attention has been given to the essential needs of Berar in the past breeding policy. The only herds we find in any way associated with this circle are Borgaon and Khandwa. In both we find the same type of breeding, *i.e.*, grade breeding to a Montgomery bull. The Montgomery answers the third need as expressed for this circle, they also possibly add to the factor of weight in its application to heavier draft but the males of this breed and the eventual character of the grade males of these herds are the absolute opposite to the general needs of rural Berar.

The Montgomery in short is not the correct type of pure breed for the establishment of grade herds in this particular tract. There has been a tendency to place milking ability at too high a value. The average typical Montgomery bullock in Berar would be only a shade more valuable than a male buffalo. For Berar purpose, the Montgomery does not and is not likely to provide a dual purpose animal when dual implies speed with power in the male and milk in the female.

There is in my opinion only one breed in India which would provide rapidly for the three stated needs in Berar cattle and that is the Hansi-Hissar of the Punjab. Such as I have seen of its action on local cows is evidence in favour of the grading it effects in creating a distinct improvement in the work capacity of the progeny. Possibly eventually a breed built from the foundations in use in the College experimental herd may provide another desirable dual type for this tract.

In the north of the Central Provinces the Malvi breed, now of some years standing at Powarkhera, supplies bulls which meet the main need of this tract, *i.e.*, powerful but slower draft ability.

The Montgomery male by itself would not be effective.

The experimental attempt at a new breed at Adhartal by crossing the Malvi and Montgomery may however in time provide the breeder's ideal for that area, *i.e.*, a dual purpose combination of efficient heavy draft and milk.

In the Southern Circle the Gaolao breed at least for the working requirements of that tract. Here as in Berar the dual purpose type as aimed at in the College experimental herd, would find a suitable market, if established.

In Chhattisgarh, the problem is difficult. There is no use attempting to build a big breed by grading Chhattisgarhi cows with either a Malvi or a Montgomery.

The climate and food supplies are all against such a breed surviving. It is not possible to lay hands on an outside pure breed of merit which without being too big would raise the standard of the local bullock. The only resource is to work with Chhattisgarhi materials, a slow and difficult process. The problem of feeding plays just as big a part as the problem of breeding in this tract.

For the Urban areas the Montgomery is indisputably the best breed to push. It may be mistaken to do so in rural areas of the Central Provinces and Berar but it is not so when milk becomes the chief source of profit. This herd is being developed at Telinkheri and already bulls of this breed are being kept for the service of the cows near city centres. Buffalo improvement is also desirable in relation to both milk and *ghi* supplies.

This survey of cattle needs and the steps taken by the department in the way of pure breeding and new breeding show that the steps taken have not been at fault except possibly in reference to the utilisation of the Montgomery to grade up the herds at Sindewahi, Borgaon and Khandwa, where the value of milk has perhaps tended to overshadow the consideration of working efficiency.

(6) *Breeding centres*:—

The chief defects of the present farms are that—

(i) There are too many centres where actual calf production is being done, in comparison with the existing scope of the work and the output of stock.

(ii) In several cases they do not provide the fodder and environmental conditions essentially linked with breeding, if effective progress is to be expected.

(iii) The whole breeding and cattle improvement problem of the provinces is being tackled on much too small a scale. If progress is to be made

whether in providing better bulls for village service or in increasing the number of effective work stock to meet the greater demands of improving tillage standards, or an increase of the milk supply for the betterment of the physique of the next generation, the present pinprick method of playing with the subject must give way to something which can show effective results within the next twenty years, and not within the next century.

(iv) Both the Central Provinces and Berar have extensive areas of forest land well grassed and watered, the former in its jungles of Mandla, Jubbulpore and Saugor and the latter in the Melghat which are not being utilised to their best purpose in regard to the development of agriculture and from which a better return could be derived by the State, if portions were to be utilised in an intensive cattle raising policy. The cost of such development in these sparsely populated areas would be small when measured in results.

The proposed policy.—This may be outlined as follows :—

1. The establishment of pure bred herds (class (*a*) of the first paragraph of this note) at—

(*a*) Ellichpur using a milk strain of Hansi-Hissar.
(*b*) Garhi the Gaolao breed.
(*c*) Telinkheri the Sahiwal breed.
(*d*) Saugor the Malvi breed.
(*e*) Pendra the Chhattisgarhi.

(*a*) This area should be definitely secured in 1927. The position is discussed in another item of the agenda.

(*b*) and (*c*) exist already.

(*d*) implies the securing of forest land in this district which is understood to be easily possible. It is designed to replace Powarkhera and to allow of an extension of this breed. The output at Powarkhera is at present much too small. There is no change in breed.

(*e*) like (*d*) implies the securing of land in this area, which I am assured is easy. It is very much better placed than any of the three small farms in this Division as a cattle-breeding centre. The change costs practically nothing.

2. The conversion of the following small cattle farms to young stock depots thus adding to the size and productive ability of the central farms under :—

(*a*) Drug, Bilaspur and Chandkhuri in the Eastern Circle.
(*b*) Sindewahi in the Southern Circle.
(*c*) Borgoan and Khandwa in Western Circle.
(*d*) Powarkhera in the Northern Circle.

(*a*) would be an extension of Pendra (1b)
(*b*) would act as an extension of Garhi (1b)
(*c*) would provide extensions to Ellichpur (1a)

(*d*) The existing pure bred herd here would go to the larger proposed area in Saugor (1d) and the existing farm would depot the young stock thus increasing the potential value of Saugor.

The running costs and overhead charges of all the above would be reduced and the actual productive capacity increased.

3. The opening out of forest areas (*a*) in the Melghat for Berar and (*b*) in Mandla for the north of the Central Provinces.

The ideal in each area is the utilisation of about 10,000 acres in each tract in block farms of 2,000—2,500 acres each—

(*a*) would consist of local Berar cows and would be sired from Ellichpur,

(*b*) of local cows of the North Central Provinces and would be sired by pure Malvi bulls from the central herd in Saugor district. In the first instance the males produced by both these grade herds [*vide* first paragraph of note, class (*c*)] would go on the market as bullocks for which there is a big demand and later, as purity was attained, they would provide large numbers of high grade breeding bulls.

The Bor forest scheme (*vide* page 218) represents a definite example of a farm of this type. I estimate that 3 to 4 of these are required in each of the above tracts though they need not be created in one year.

4. Under the class of new breeds [1st paragraph type (*b*)]—

(*a*) A small experimental herd at Adhartal dealing with steps to combine the qualities of the Malvi and Sahiwal.

(*b*) The experimental herd at the College farm working on a dual purpose breed for the needs of the south of the Province and Berar. Both the above already exist.

5. In association with (1c), *i.e.*, the milking breed of Sahiwal at Telinkheri in that, as at Telinkheri, the breeding would be for the provincial needs of all urban and semi-urban areas in the Central Provinces and Berar, the establishment of a buffalo breeding herd in Saugor. In this case breeding of type (*c*), paragraph 1, would be used and local she-buffaloes would be sired by pure Delhi males brought in from outside the Central Provinces.

The area would for convenience of control be situated in proximity to that selected for the pure Malvi herd (1d).

Features of the scheme.—This scheme if accepted would give—

(1) Each main tract one effective pure breed central farm supported by one or more young pure stock raising depots.

(2) It would provide Berar and the Central Provinces each with grade breeding farms on a large scale thus utilising the forest for agricultural purposes.

(3) It would provide for the early improvement of the milk supply, both cow and buffalo, of our urban areas.

It is impossible to lay too much stress on the need of expansion of our cattle-breeding policy. There has been nothing done in the Punjab in the past of greater value to the present stock characters of the cattle of that Province than the policy which years ago decided on the utilisation of the thousands of the then sparsely populated areas which constitute the Hansi-Hissar farms of today and which make possible the steady improvement of the village livestock district by district now in progress in that Province.

At the present day with square miles of country at our possible disposal we find the Western Circle and the Northern Circle buying their work stock from outside the Province. In the north in particular the Central Provinces is putting money into the pockets of the Central India breeders who possess almost a monopoly of supply and charge accordingly, while its own areas go unused.

The cost.—This is outlined in the paper attached to this note.

The capital cost in Berar has been estimated at Rs. 65,000. This is on the fair assumption that the final possession of 250 acres of Ellichpur military land with the needed buildings will cost the Province nothing.

It represents what is wanted as a minimum as regards the area to-day. But I do not think we should stop there. I regard it as essential that there should be at least two more areas of the type of the Bor forest and that as a Board we should make it clear to Government that the interests of agricultural development in this area demands this. I may point out that I understand that the Bor forest only brings in Rs. 500 at present per annum to the Forest Department.

These additional blocks should be earmarked for like expansion. They need not be developed for 2—3 years time but they should be clearly available whenever the time comes. Each would require about Rs 30,000 capital. The whole Berar scheme would thus demand a capital outlay of about 1¼ lakhs to put in on a firm footing, to allow of provision of between 30 to 40 pure bred Hansi bulls a year and some 150 to 170 pairs of bullocks per annum in a few years time giving place under twenty years to a supply of 300 high grade breeding bulls to say nothing of a supply of cows of reasonable milking capacity.

The proposal for the Northern Circle asks for roughly half a lakh of capital now. The Saugor centre with its Powarkhera depot will in a few years time be in a position to supply, if this is accepted, 80 pure bred bulls per annum. The grade herds centre as in the Melghat, will cost about Rs. 30,000 each. As in Berar one should be taken up at once and at least two should be determined on in a year or two year's time. The total for the full scheme would be 1 lakh. The production would be as in the Melghat.

In the Southern Circle the present proposal will not imply increased capital cost but the arrangement of a central farm and depot will double the output of first class bulls.

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Under provincial I have placed the two sections dealing with milk production. That at Telinkheri already exists and requires no mention.

There have been frequent requests for steps to improve the buffalo and the proposals now made enable this to be begun on a fairly large scale at a comparatively moderate capital cost.

The total immediate capital cost over the whole Province is only 1½ lakhs with an eventual addition of 1¾ lakhs for the full development of the Melghat and Mandla schemes.

The present recurring expenditure on cattle-breeding is ludicrously inadequate. I have myself seen more than this total for the Province for a year spent on a single bull bought by the Argentine Republic.

The proposed scheme, in as far as it is stated on the attached estimate and without reference to the further extension in the Melghat and Mandla, calls for double the present annual expenditure. At present we can supply perhaps 40 to 50 bulls a year, and a number of these as from Sindewahi, Borgaon and Khandwa can scarcely be said to be satisfactory breeding bulls. The present scheme to the extent allowed in the estimate would permit the supply in four to five years time when developed, of four times the number of reliable bulls of different breeds and an outturn of as many as 180 to 200 bullocks per annum. Each year as it passed would see the standard of these bullocks improve to that of particular pure bred sires type and I maintain that in fifteen to twenty years these bullocks could issue as breeding bulls. In the event of the full development in these forest areas the total bullocks would be about 600 per annum in the immediate future and eventually there would be a potential source of high grade bulls to say, the extent of 500 per annum apart from those provided by the pure bred herd farms and their associated depot.

By the present breeding arrangements, it will take 150 years to improve effectively the cattle population of the Province. By the adoption of the proposals, the same results can be secured in 25 to 30 years.

Rough Estimate of Cost of New Cattle-Breeding Scheme.

I.—BERAR—WESTERN CIRCLE.

A.—Ellichpur Farm.

Non-recurring Expenditure.	Rs.	*Recurring Expenditure.*	Rs.
Purchase of 30 Hissar cows and bulls.	8,000	Pay of menials ...	(*a*) 5,000
Fencing for 250 acres ...	8,000	Feed and care ...	8,000
Repairing, building and erecting Superintendent's quarters.	5,000	Building and fencing ...	1,000
Purchase of tractor, bullock and implements.	8,000	Purchase of stock ...	500
Purchase of motor lorry ...	4,000	Miscellaneous ...	1,500
Total ...	33,000	Total ...	16,000

(*a*) 10 ploughmen @ Rs. 15 each, 4 milkers @ Rs. 15 each, 3 *chowkidars* @ Rs. 14 each, 3 coolies @ Rs. 8 each, 1 tractor man @ Rs. 50 and variable labour Rs. 900.

B.—Graded herd in Bor Forest (per 2,500 acres).

Non-recurring Expenditure.	Rs.	*Recurring Expenditure.*	Rs.
200 cows @Rs. 50 each ...	10,000	Pay of menials ...	3,000
3 Hissar bulls@Rs. 500 each ...	1,500	Teed and care ...	10,000
Cost of bullock and implements	4,000	Buildings and fencing .	250
Cattle sheds and godowns ...	8,000	Miscellaneous ...	750
Quarters for Superintendent and staff	6,000		
Miscellaneous water-supply, etc.,	2,500		
Total ...	32,000	Total ...	14,000

C.—Cost of two depots at Borgaon and Khandwa ... 5,000

Western Circle Total ... 65,000 Western Circle Total ... 35,000

II.—NORTHERN CIRCLE.

A.—New Malvi breeding centre in Saugor (1,500 acres).

Non-recurring Expenditure.	Rs.	*Recurring Expenditure.*	Rs.
Cattle sheds and wells ...	15,000	Pay of menials ...	2,000
Quarters for Superintendent and staff.	5,000	Feed and care ...	8,000
		One depot at Powarkhera ...	2,000
		One experimental herd at Jubbulpore.	3,000
Total ...	20,000	Total ...	15,000

B.—Graded Malvi herd in Mandla 14,000

	Rs.		
Costs as in I-B ..	32,000		
Northern Circle Total ...	52,000	Northern Circle Total ...	29,000

III.—SOUTHERN CIRCLE.

	Rs.
By increase of existing Gaolao herd at Garhi ...	13,000
Cost of depot at Sindewahi ...	3,000
Total ..	16,000

IV.—EASTERN CIRCLE.

	Rs.
By amalgamation of three existing herds into one (site to be selected 1,200 acres) ..	10,000
Cost of two depots at Rs. 2,500 each ...	5,000
Total ...	15,000

V.—PROVINCIAL.

(Maintenance and breeding of dairy cattle.)

	Rs.
A.—Maintenance of Telinkheri dairy farm as at present ...	25,000
B.—By improvement of buffaloes (farm of 3,000 acres to be situated in Saugor).	

Non-recurring Expenditure.

	Rs.
Cost of breeding stock ...	7,000
Cattle sheds ...	5,000
Quarters for staff ...	3,000
Wells, etc. ...	2,000
Total ...	17,000

Recurring Expenditure.

	Rs.
Pay of menials ...	1,500
Feed and care ...	5,000
Miscellaneous ...	500
Total ...	7,000

Summary of Expenditure.

		New Scheme		Present Expenditure Recurring.
		Non-recurring.	Recurring.	
		Rs.	Rs.	Rs.
I.	Western Circle ...	65,000	35,000	9,000
II.	Northern Circle ...	52,000	29,000	6,000
III.	Southern Circle ...	...	16,000	11,500
IV.	Eastern Circle ...	...	15,000	10,000
V.	Provincial ...	17,000	32,000	25,000
	Total ...	1,34,000	1,27,000	61,500

Oral Evidence.

29620. *The Chairman*: Mr. Allan, you are Principal of the Agricultural College at Nagpur?—Yes.

29621. You have provided the Commission with a note of the evidence which you wish to give. Would you like to amplify that by any statement at this stage?—No, I do not think so.

29622. Would you give the Commission a brief account of your own training and past appointments?—I got my honours training in science at Cambridge; after that, for three years I was schoolmastering in a science college in Yorkshire. Subsequent to that, I went back to Cambridge for about two years and took my Licenciate Degree in Agriculture. I then worked for some time on one or two farms, and after that I got an appointment here. I have been Principal of the Nagpur Agricultural College since 1907.

29623. I might ask you at this stage whether you can account for the great interest that you have taken in the cattle-breeding problem?—I have several friends and relations closely associated with cattle-breeding one way or the other; in my early days I was closely associated with them. I have an interest in stock breeding, and I have worked on it at the college dairy farm.

29624. What is your staff at the College? Have you a deputy?—No. The staff of the Agricultural College consists of seven Assistants.

29625. Are the officers of the Agricultural Department engaged in research doing any teaching in the college?—Dr. Annett takes certain parts of the course in Chemistry and Mr. Mehta looks after the Botany of the college as well as his own research work in crops.

29626. Those are the only two who are doing the teaching?—Mr. Dastur, the Mycologist, takes a certain number of classes in Mycology, and the Entomologist, who is an Assistant Entomologist, takes the section in Entomology in addition to looking after his own work.

29627. So that the research officers of the department are in close collaboration with the work of the college?—Yes, very much so.

29628. Is that a satisfactory arrangement?—Distinctly; it is absolutely essential that it should be so.

29629. What does your own work mainly consist of?—My own work is to look after the teaching work of the senior students in the third and fourth years; agriculture is a good deal of it; I have also to look after a little of the agricultural work of the second year. I take bits here and bits there; I do not take the whole course right through. I take certain subjects, agricultural economics with accounts and costing and like matter; for that part of the training I have not got any one qualified except myself.

29630. Is a good deal of your time taken up by office work?—The ordinary office work takes about three hours or so.

29631. You feel you have got reasonable staff on that side?—Yes, I think so, as far as my actual office is concerned.

29632. You do not complain of the calls on your own time in that direction?—No, it is quite reasonable.

29633. Are any of your seven Assistants engaged in any research work?—No, practically none; they are practically all teaching Assistants. They have not really got time for it.

29634. Are any of them capable of research work, in your judgment?—No, not true research.

29635. If it were possible, no doubt, you would like to see them in their own time engaged in work of that sort?—Yes, the staff is very full up with work. The amount of work which the staff has got to do is almost excessive in some cases.

29636. On page 197 of your note of evidence, you make quite plain the nature of the Central Body which you wish to see set up, and you suggest measures for financing that Body. You say, "Its working funds could be secured by the levy of a small export cess, ranging from one anna to four annas per cwt.". Has it occurred to you that that would mean that export crops would be paying a cess which would be spent on non-export crops as well as on export crops?—I have proposed that it should be spent

chiefly on the staple crops, except for that section of research which may influence the whole lot.

29637. Do you think you can get much, for instance, out of rice by any export cess —No, I do not.

29638. And you call rice one of the main staples?—Yes; a fair quantity is exported, specially if we include Burma.

29639. Do you think that the constitution of the body that you suggest here would result in a greater part of the members of the body responsible for allocating funds being technical men?—Not necessarily technical, but partly technical. I should like the body to be selected really by the Government of India. I am looking forward to a body that would be permanent, and almost a Government body.

29640. Do you think there might be difficulty in getting, if I may so call it, a bold allocation of funds in essential directions by a body consisting mainly of technical men? These technical men would be interested, most of them, in one or in another Province, and it might be an advantage for them to allocate funds to a particular Province for a particular purpose?—I do not propose the allocation of funds by Provinces; they should allocate the funds to the committees or bureaus, who would be working on the lines of the Indian Central Cotton Committee.

29641. Entirely to the crop bureaus; and you do not anticipate that these crop bureaus would be working in conjunction with provincial organisations and, to some extent, assisting provincial organisations?—They would assist provincial organisations. These would have their representatives, on the bureaux, very much on the lines on which the Indian Central Cotton Committee is working at present.

29642. You say that there are two Botanists in this Province at the moment, and that the existence of the second one is the outcome of the constitution of the Indian Central Cotton Committee. Is he engaged the whole time on cotton research?—He is entirely engaged on cotton research. Mr. Youngman is entirely engaged on cotton research and Mr. Mehta is paid by the Indian Central Cotton Committee; but we were to have had two a long time back. Our original staff was to contain two Botanists and we want at least two Botanists very badly.

29643. Now, on the question of agricultural education, I want to ask you to tell the Commission a little about the scheme of education at present given at Hoshangabad. Is that one of the two vocational middle schools that were attempted some years ago?—Yes; we started one at Hoshangabad and the other at Chandkhuri and they did not really take on well, particularly the latter, because there was not really very much interest in it. With regard to the other, the only drawback seems to have been that the men who wanted to educate their sons were rather inclined to educate them further than this middle school allowed. I do not say that even then they will go on, but there seems to be the possibility of that. I think the present school has got a very fair chance in front of it, except that it is very expensive.

29644. What does it cost per pupil?—I am afraid I have not got the figures now.

29645. Perhaps you will get those figures for us?—I can get them for you.

29646. Would you say that it is likely that there will be a demand for that type of education in other districts of the Province?—I understand from what I hear that it is likely in the Hoshangabad neighbourhood and in the surrounding districts. I understand there is an interest created in the school and other people are thinking too of educating their sons on right lines. I do not think that the figures giving the cost per student now will be very valuable because it is just recently that we have started the school on its present lines.

29647. The teachers have been through the Agricultural College?—Yes, certainly three out of four have been through the College.

29648. You regard that as an important qualification?—It is absolutely essential; at least two men out of every school should be so trained.

29649. Now, on page 203, in answer to our Question 6 on Agricultural Indebtedness, section (*c*), you suggest: "The right to mortgage might be restricted to limitation of this right to the mortgage being effected through recognised or Government controlled land mortgage banks". Have you ever discussed that from the legislative or legal angle with any competent people?—No.

29650. That of course could not help the ordinary occupancy tenant who would still be without any right of mortgage, would he not?—Yes.

29651. Unfortunately an important part of the cultivators in this Province are all occupancy tenants, are they not?—Yes, a large percentage.

29652. I have read with great interest and I am sure my colleagues also have the note* on '*Future Cattle-Breeding Development in the Central Provinces and Berar* which embodies your own views. The difficulty at the moment, I take it, is that the money for any such comprehensive scheme is not available?—Yes; I hope there will be money. We have been contributing very heavily towards the Famine Insurance Fund in this Province and if they did not demand quite as much in annual payment to this Insurance Fund we might get on with the work.

29653. Do you attach great importance to the improvement in the breeds and in the practice of animal husbandry?—Yes; I think each man who is going to start breeding should really breed bullocks rather than breed bulls. I think it is much better that money be invested in grading up local cows with the object of producing good working bullocks.

29654. One of the difficulties of the situation at the moment appears to be to persuade the cultivator to give the cow any food. The cow appears in seasons of shortage to suffer the worst, as a result of which of course the calf suffers too?—I think that if the cow produced plenty of milk it would not be made to suffer so much, and would get a good supply of food.

29655. Probably you attach importance to an increase in the consumption of milk and milk products by the cultivators as a valuable addition to their diet?—Yes; certainly.

29656. For the vegetarian population it is almost essential that some milk products should be consumed to complete the diet?—Yes; it undoubtedly helps the diet.

29657. You point out, on page 208 of your answer to Question 23, three groups for whose needs an Agricultural College under a University should provide. I want to ask you whether you see any signs of a demand from either group (1) or group (3)?—Yes; under group (1) I have a hope that there is going to be a demand. At present in the first year I have got at least six or seven men whose holdings or land possessions run to about 1,000 acres.

29658. And their intention is to go on with the business of cultivation?—Yes that is the present intention, the intention as told me. But I am afraid that is what the students generally tell me when they first want admission. Each student starts with the intention of farming his own land; but his association with land, if analysed, will be found not infrequently to be but 20 to 25 acres. It is not worth while to study in the College for four years in order to go and cultivate a farm of 20 acres. I look for men who want to get back and cultivate or manage their estates and who have large holdings, so that if they do not want service or they do not get employment, at any rate they have got a job to go to.

29659. Is there any sign of a demand for training people as managers?—I get requests for such men. My difficulty is that all the better men are absorbed by the department and you cannot expect a young man just out from the College to look after a big estate. I give them three or four years' practical work in the College course, but that does not keep them fully in touch with farming.

29660. Do they get any training at all in the economic and commercial side of farming?—In the College course they get training. There is a regular course of agricultural economics as far as you can call anything agricultural economics.

29661. Nothing but experience is able to provide the power of management?—I agree.

29662. You may be able to pass examinations, but something more than that is necessary when you are left with a 300 acre farm on your hands?—Yes.

29663. On page 209 of your answer to Question 23, you give your views as to the services that rural and middle school education should give to the public. You think it is the case that the centre of the difficulty lies in the teacher?—Yes.

29664. Is he paid enough to attract the right type of man?—I very much doubt it.

29665. Has he been trained?—Yes; there are training schools; but I do not think they are trained in this direction of rural life or agricultural life.

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* *See* pages 211—219.

29666. That is what I expected you to say. Do you think it is possible for a man to give, for instance, helpful nature study classes unless he be either greatly gifted in that direction or particularly trained?—I think so; he must be largely gifted.

29667. It is not a very easy thing to do, is it?—No.

29668. Have you any views about adult education?—My own view about adult education is simply the extension of demonstration work carried on by the department; that seems to me to be the only way really to educate the farmer from that point of view.

29669. That is technical education?—Yes.

29670. Have you any views about general adult education?—None, except such as can be done by the help of lantern lectures or cinema demonstrations.

29671. Have you ever thought about the future of female education in this country?—No, I have not.

29672. Women have now got the vote, have not they?—I believe so.

29673. Like the small cloud on the horizon no larger than a man's hand, that may grow, may it not?—Yes.

29674. *Sir Henry Lawrence*: Do you think the relations of the Agricultural Department with the officers of the Revenue Department are sufficiently close?—I think so in this Province; we find no difficulty in getting things done by revenue officers; the District Officer is always willing to help; of course it varies a lot: some District Officers are more active than others, but I do not think I have heard of any really great difficulty. Occasionally there is difficulty in the lower grades; but as far as the senior officers of the Revenue Service are concerned, I do not think the department has really had any difficulty in getting their assistance when it was required.

29675. Do they ever take any interest in the research work done in the College? Do they come and visit the College?—No.

29676. Has it been the practice here to give revenue officers of any grade any training at all in agricultural matters?—Yes, some years ago we had a sort of short course of about six weeks or eight weeks for young officers of the Indian Civil Service.

29677. Only the Indian Civil Service, not the Provincial Service?—Subsequently there was a sort of general course given here, partly in revenue matters, in which a few agricultural lectures were included; that did include some Provincial Service officers.

29678. Are those courses still in existence?—Yes, I suppose they are. We had one about a year ago; they do not come on regularly; they come on in spasms.

29679. It is not annual?—No, not exactly annual; it is more like every second year. Agriculture plays a part only in that a certain number of lectures on soils, crops, implements and things of that sort, are given; it is very limited.

29680. How many officers attend these lectures?—I think last time there were about 15 or 20 or something like that.

29681. How long does the course last?—About 3 weeks.

29682. Do you think it does any good in opening the minds of revenue officers to the work that the Agricultural Department is doing?—Yes, I think it does; I think it might with advantage be longer, but it certainly has that effect.

29683. But it has never stimulated any officer sufficiently to cause him to come and see what you are doing?—No, I do not think I have ever seen one walking round on his own account to see what is happening.

29684. *Sir Thomas Middleton*: I think you have had longer experience in a single institution than almost any officer now engaged in education in India?—I think so, yes.

29685. What have you got to say about the general quality of the students entering the College? Have you noticed in the twenty years any marked change in the quality, *i.e.*, comparing the best that you met in 1907, with the best of the present time?—No, I do

not think I have really noticed any marked change ; we had some very good men in the early years, and then we had a period when we had rather poor quality ; latterly one of my chief reasons for getting affiliated with a University was the hope of getting hold of men of a better stamp. In the early stages the majority of men in agricultural colleges were distinctly poor, men who might have passed the third class Matriculation, but latterly we have had far more men of first and second grade Matriculation.

29686. That has been the result of affiliation ?—Yes, I think it has been stimulated by affiliation, certainly.

29687. What was the entrance standard originally when you took up your work here ; was it Matriculation standard ?—No, it was a supposed Matriculation standard ; it was really a college entrance examination standard ; men who had passed the Matriculation were accepted ; men who had not passed the Matriculation were given an examination. A certain percentage were non-matriculates. Nowadays, of course the non-matriculates are put to the two-year course of the College.

29588. What proportion of the students at present are non-matriculates ?—At present in the College I should think it is about 90 per cent who have matriculated ; the total of the certificate class in both the first and second year comes to about 16 students out of about 115 altogether.

29689. Has the question of making the Intermediate stage the entrance standard come on the horizon ?—It has come on the horizon, but not very strongly ; I am not very much in favour of it in some ways ; my general idea in agriculture is to get the student when he is comparatively young. If he goes off for two years science I am rather doubtful about his coming back with any enthusiasm to the land. My practice in the agricultural course in the College has always been to have a considerable amount of agriculture in the first two years ; in the second two years I do not have quite so much field agriculture but I have rather more laboratory work. I always give them agriculture to begin with, and then on that I superimpose the more scientific part of the course. I once tried having science first and agriculture later, but that did not work ; I lost all the boys who had any chance of being farmers ; they were all eliminated on the chemistry and botanical part.

29690. About what age are the students when they come to you, having passed the Matriculation ?—They ranged anywhere between about 18 and 20.

29691. Have you any views as to the teaching of agriculture in high schools so as to make agriculture a subject for Matriculation ? That has often been suggested to us ?—I am not all in favour of agriculture as a school subject. Any agriculture taught in schools at any rate up to the middle school standard, ought not to be taught as an examination subject. Once you get it taught as an examination subject it means that the teacher will simply cram up from a text-book or something of that sort, and the boys will not really know anything. We use to teach it from Fuller's Primer at one time in some of our schools, but they merely learned Fuller's Primer by heart and did not know much about it.

29692. That is to say, from the point of view of agriculture it is not desirable. Looking at it from the other point of view, the effect on education in other subjects, what have you got to say ? I am thinking of the crowding of the curriculum for the Matriculation ?—I think the curriculum is pretty well full at present.

29693. Is it not overcrowded at the present time ?—Yes, I should think so ; I do not think it can possibly carry another subject. We have in our high school courses an agricultural botany course laid down as one of the voluntary subjects, but up to date it has not been developed in any high school.

29694. On page 196 of your note you say that the work of the first description should be financed from a central source. Do you mean wholly or partially ?—Partially; I do not think Local Governments can entirely avoid part of that expense ; I think it must be remembered that if the research is developed the Local Government's extension expenditure will increase, so that they meet their part of it.

29695. Had you formed any view as to what "partially" meant : what percentage should come from other sources ?—No, I cannot say I have gone into detail of that kind.

29696. But you recognise that it might be quite a variable percentage ?—Yes some Provinces are much poorer than others.

29697. The scheme for cattle-breeding has been referred to, and it has been pointed out that one of the great difficulties, perhaps the chief difficulty in cattle-breeding in

this country, is the neglect of the cow. You stated that when cows give milk they are well fed ?—That is my experience round Nagpur; when the cow is giving a good yield it is well fed.

29698. A particular cow may be lucky, it may have been properly fed from birth; it may then be picked up by a milk seller and continue to be well fed. But what happens in districts where the cows are not selected by milk sellers; is any attempt made to supplement the grazings ?—There is not very much attempt; it is done here and there, but commonly I should say they depend on what they can pick up. There is some stall feeding in Berar with a certain amount of *juar kadbi*.

29699. In Berar, where there are very few grazings, the cattle could not exist without some stall feeding ?—No.

29700. Your scheme aims at grazing tracts in the north of the Province ?—My scheme aims at large areas of forest land which, I think, could be more satisfactorily utilised in this way; the forest is not by any means fully grazed.

29701. You aim at getting a larger and more rapidly developing sire ?—Yes.

29702. The object being that it should transmit its qualities to its offspring. The general quality of the cows in these grazing tracts has been fixed by the natural conditions. What is to happen if you suddenly introduce improved sires and find yourself with more rapidly developing calves but with no improvement in the natural food supply ?—Of course it is the food supply that is the great difficulty.

29703. That is the limiting factor ?—Yes.

29704. So that it is of very little use starting to improve the stock until you improve the conditions under which the stock live ?—That is a little pessimistic; conditions are not equally bad everywhere; they are bad possibly in the rice tract where there are far too many animals on the common grazing grounds; but in other parts they are of quite good size.

29705. We know there are such tracts; we have seen them, though not in the Central Provinces where we have only been in Chhattisgarh ?—You have not seen our best.

29706. Is not any attempt now being made, by propaganda or otherwise, to increase the growing of fodder crops ?—No. I cannot say really that we have gone very far in the propaganda and growth of fodder crops. We have had a certain amount of ensilage experiments shown in the district.

29707. Do you see any source in these grazing areas from which a sufficien supply of fodder for the dry season could be secured ?—There is plenty of grass in the forest areas which could of course be baled but up to date, though it has been tried several times, there has never been any sale for the grass.

29708. Your hope is that, if you produce bulls and introduce some more valuable strain of cattle, a demand will arise for existing supplies ?—I do not think there is any lack of grass in the Province at all. During the War any amount of grass was taken away without affecting the total stock in the Province.

29709. Would it be possible to do anything with ensilage in these areas ?—There is a possibility of ensiling grass like spear grass in certain parts. But I think ensilage really comes to be effective when you are dealing with a dairy industry rather than when you are dealing with work bullocks, and I doubt whether we can say that it has proved economical for a man at present to grow a crop of *juari* purely for the sake of fodder or for putting it into a silo.

29710. I was thinking of the ensiling of natural grasses, not for dairy cattle but to increase the flow of milk where you are attempting the breeding and rearing of better young cattle ?—Any one who has started breeding farms in the areas could easily silo spear grass and in fact it has been done with success. Probably that is the best way of using it.

29711. *Sir Henry Lawrence*: In what month would that have to be cut ?—About September.

29712. The people are then busy in their fields ?—They are not then so active as they become later. September would be rather wet. It would be out of the question to do it in October as everyone is busy otherwise. That is why so much of our grass gets dry.

29713. Could ensilage be made in pit silos at that period in these grazing tracts?—I think so if the site were fairly nigh.

29714. *Sir Thomas Middleton* : Under General Education, you begin by saying that advance in agriculture in this country depends on the education of the bigger landowners to a sense of their responsibilities as landlords. Have you, in the period during which you have been in the Province, noticed an advance in that respect?—No, I cannot say that I have. I have got to know a large number of men who are interested in land, who are landowners but I do not think I could put down in black and white that I have seen it increased.

29715. You hope that these students to whom you have referred will in the future assist in this particular object?—Yes. There are some who simply use their villages as sources of income through moneylending and who have no real interest in the village at all. I think myself that they are not educated by experience and that is the real cause.

29716. You think that there ought to be more examples of good farming?—Yes.

29717. And that leads you to suggest that the period of service of your district staff should be shortened?—Yes.

29718. At any rate that they might be permitted to retire on proportionate pension?—Yes, retire at a time when they feel fairly active and can start on their own farming. We have got one or two such examples.

29719. If they made a success of the venture you think they would be more usefully employed from the point of view of the State than even as District Officers?—Yes.

29720. They could well be spared?—Yes, because by the time these men go through, say, twenty years' service, there would be plenty of other men coming along behind them. I am certain that it would be a distinct help if some encouragement were given. I am all for encouraging the senior staff of the department to settle down as farmers, and, once they settled down in the villages, I think myself that a great many of them would take to their own farming.

29721. *Dr. Hyder* : You divide research into two parts, general and local. I would ask you to look at the scheme which you have outlined. Do you not think there would be a tendency for all research to become entirely central and for local research to disappear. Since the financing would be in the hands of the Central Body, people in the Province would say: Well, let us save some money here and push these schemes over to the central financing body?—I did not think of that. When I said 'general' I really referred to research on the lines of the main staples of the country. For instance, we have a good deal of orange cultivation, and I consider that a certain amount of horticultural work could be done in the improvement of that crop. I do not think that would be work for a central body of research. Oranges grow under particular soil and particular conditions and there are various sorts of oranges.

29722. Well, that point simply occurred to me when I read your note. I did not suggest here really that all research should be carried on in certain centres. I imagine that each department would have to carry on its research very much as it is doing now, but if financial and other assistance could be given than that would be all to the good.

29723. Would you like to have as you say a Minister, that is a member of the Governor-General's Council?—Yes, I meant to say a single Ministry for Agriculture.

29724. Would you rather have that money for research in agriculture than for the post of a member with his secretariat and all the other paraphernalia attached?—I had not thought of that, I had only thought of the man, but I would certainly prefer the money rather than the Secretariat and the staff.

29725. What is the total area which you have under ground-nut? I understand that it is only about 30,000?—Yes, I think it is about that. But it is expanding, and I consider that it is going to expand on a very big scale. By next year, I think that it will be double.

29726. Would it displace millets?—It would displace cotton to begin with.

29727. Is it going to be more profitable?—Yes, it is going to be more profitable.

29728. Would it displace the inferior millets and pulses?—You would have to associate that question with the question of the pig nuisance. The inferior millets and pulses are associated with rather more jungly tracts and there you come up against the pig trouble which is the chief trouble in this Province.

29729. *Sir Henry Lawrence*: Are there fewer pigs in the cotton areas?—Yes, I think so.

29730. *Mr. Wills*: Do you think that the members of the Agricultural Service in this Province have sufficient insight into the working of the Revenue Department. In the course of their training for instance, do you think they get such acquaintance with the working of the Revenue Department as they ought to have?—No.

29731. I was thinking particularly of the granting of *taccavi* which is done almost entirely by the Revenue Department. Would it be of any assistance to them?—Yes, I think it would be of great help if there was a little more of that sort of things.

29732. To take another instance. Supposing in the course of the settlement operations, if a member of the Agricultural Service could be detailed to work for a short time in a settlement, he might be very valuable to the Settlement Officer from the point of view of his agricultural knowledge and he might also pick up a good deal of the work in connection with the land revenue system in the Province?—I agree with you.

29733. *The Raja of Parlakimedi*: You say that through lack of staff sufficient investigation into horticulture and vegetable growing is not carried out?—Yes.

29734. May I know to what extent you require it to be supplemented?—We could certainly do with a real expert in fruit-growing. We want somebody who would be able to devote his whole time to this question. I should certainly think that our orange cultivation would be very much encouraged if we could have the services of an expert who would devote his whole time to it. We devote practically no attention to vegetable cultivation or fruit-growing. Anything which is done at all is done by the Deputy Director of Agriculture who cannot, of course, give that amount of attention which is absolutely essential.

29735. What would an expert horticulturist cost per year? I do not think that he ought to cost much?—I should think that he ought to be a fairly well paid man. He ought to get about the pay of an Imperial Officer.

29736. Would you require demonstrators and also places where they could conduct their experiments?—Yes; we have got waste land; it is possible for us to develop that as there is much scope.

29737. Some demonstration work would be necessary?—Yes, but that would not be a separate thing. I should think that the officer, if appointed, would be more in the nature of a research officer in a sense. He would work with the Deputy Directors of Agriculture and obtain their assistance.

29738. You say the appointment of Agricultural Engineer is only recent and that this officer has since resigned on account of the unsatisfactory conditions of his service. Has the whole thing closed down?—Not closed down; it is simply resting on its oars so to speak; we are waiting for another Engineer in other words. This Engineer left I think largely because he did not consider his conditions of pay were satisfactory. He was not on the same cadre as the rest of the agricultural officers, and, as he was not entitled to overseas pay and free passages he considered he had a grievance. He wanted to be on the same general level as the rest of the department. I personally agreed with him because I consider that an Agricultural Engineer is just as important an expert as a Chemist or a Botanist.

29739. Is any force being brought to bear on the Government to re-appoint him?—As far as I know we have not done so. He is going to be replaced but I do not know what steps have been taken in this direction.

29740. Is there a sufficient number of schools in which to train teachers of nature study?—I honestly do not think that there is any place which can train them in nature study. There are normal schools of course where they have a certain general training in nature, I suppose. In my opinion, nature study is an extraordinarily difficult subject to teach; it is a question of selecting the right type of man to do it.

29741. During your experience have you found many people who take interest in such things?—No, I cannot say I have found very many.

29742. Do people of such qualifications have any special pay or concessions given to them as an impetus?—I do not think any special pay or concessions are given to them.

29743. Are there any available at all?—I think there are one or two men who have a fair idea of things. I think there are one or two in the normal school. The student who comes from the Agricultural College has a better chance of being a good teacher than anybody from the Science College or any other college. My own opinion is that teachers of nature study in normal schools should be largely recruited from the Agricultural Colleges.

29744. Do you think enough is done in the Agricultural Colleges to create, to some extent at least, an interest in this sort of nature study?—It is not the job of the Agricultural College to train nature-study teachers.

29745. At least to open their eyes, I mean?—Yes. Teachers who are in touch with country life and with crops and grasses and weeds and so on would be able to help them to teach other people.

29746. For field demonstration work, do you think there is enough staff at present?—No, only about half the staff there ought to be.

29747. What is the present number?—About 83.

29748. Are they all properly qualified people?—Yes, they are all men who have been through the Agricultural College; some of them have taken two-year Certificate course and some the Diploma course which preceded the present Degree course.

29749. Over what area are the present men spread?—Over the whole Province. One man has roughly 500 or 600 villages or something like that. No one man, of course, can deal successfully with 500 or 600 villages.

29750. *Sir James MacKenna.*—With reference to the financing of central research, I see that, like a large number of witnesses who have made a similar recommendation, you suggest the levying of a small export cess. Now, the incidence of a cess on the crops exported would be very uneven. For instance, a cess on Burma rice would come to as much as a cess on all the other exports put together. Do you not think it would be more equitable to have an acreage cess on crop area?—I have not thought out the details. I made my cess a varying figure because of the variation on the amount of export. For a large export the figure would be smaller, while the cess would be larger for a smaller and probably more valuable crop.

29751. That point occurred to me when thinking of the position in Burma. You have not thought it out?—I have not thought it out from the point of view of acreage. I thought of it as probably being paid by the man who bought it. It would be such a small sum that it could not make much difference in the price to the consumer whereas the other method would mean additional work to the revenue officer in collecting one anna or so per acre.

29752. You would not like me to take you into the further financial implications of the acreage rate?—No.

29753. Assuming either method for raising this money were adopted, either an export cess or an acreage rate, how would you like a scheme by which the collection was provincial, and a percentage of it was earmarked, by the goodwill of the Provinces, for central research, the balance being devoted to their own agricultural, veterinary and co-operative movements or would you prefer to have the whole thing pooled and administered as a central fund?—I would prefer the whole thing to be pooled and administered by the Government of India.

29754. Speaking to you as a senior officer, I would like to know your opinion with regard to the recruitment of Agricultural Engineers. I see there have been many changes in the post of Agricultural Engineer in most Provinces. Do you think the difficulty is that these men have generally been recruited on special scales of pay and outside the regular cadre, and they have been enticed away by more attractive pay offered by private firms?—Yes, that has something to do with it. I know there was a feeling that they were not treated like the other officers in the department.

29755. What is your view? Do you think they should be on the cadre of the department?—I think so, most distinctly. In the early days they were recruited in a haphazard way, and some of them were more of the type of mechanics, and could hardly be on the same cadre but now I think if you want a really good Agricultural Engineer he should be on the cadre and recruited in the same way as the other officers of the department.

29756. *Prof. Gangulee*: You are a senior and experienced officer in the Central Provinces and you have been in service for twenty years. I should like to ask you what definite change or changes you have noticed in the methods of cultivation during that period?—It varies from tract to tract. If you go, for instance, to the cotton tract, you will find a considerable increase in deeper cultivation work than there used to be. For example, you will find a large number of inversion ploughs in operation, and things of that kind, but in the wheat tracts one does not notice much difference in the methods of cultivation. The crop cultivation is a little deeper than it was, and in certain parts of the country ordinary broadcasting of seeds is giving way to line sowing. Those are the chief variations in cultivation

29757. These changes that you just mentioned are generally due to the activities of the department?—Yes, to a great extent they are undoubtedly due to the activities of the department. In fact, a considerable amount of demonstration and pressure has been required to secure their adoption.

29758. Am I right in thinking that your department, through its propaganda work, has been able to create confidence among the cultivators?—I think so, wherever we get in touch with them, but we are only in touch with a small number.

29759. You rightly emphasise the need for further demonstration and propaganda work, and you say here the most effective form of agricultural education in its widest sense at present is actual demonstration and propaganda work among the adult agricultural population of the Province. Do you think such a step would have a very important effect on the higher agricultural education that you are giving here?—No. What I feel is that if these people were educated to find out there was some advantage in better methods, they would be more inclined to think it worth while to get their sons educated at any of these schools which may be started on the same lines as the schools at Hoshangabad.

29760. Agricultural education might be more popular if there were more effective demonstrations?—If we increased the number of demonstrations, yes. If you compare the conditions today with the conditions prevailing twenty years ago when the Agricultural Department practically did not exist (such as it was, it was very feeble), you will find the people nowadays show greater interest in agricultural education than they used to. Nowadays we have a very much wider influence than we had, and that is largely the result of agricultural demonstration work. These two things go hand in hand.

29761. Is it your opinion that the landlords, the malguzar and the general public fully appreciate the effect of demonstration and propaganda work done by the department?—No, I do not think they appreciate it as they might.

29762. You mean as much as they ought to?—Yes. Here and there, however you find big landlords taking considerable interest in it.

29763. You are no doubt aware of the evidence given by some witnesses before the local Retrenchment Committee in 1922?—Yes.

29764. That Committee wanted to lay their axe on the demonstration and propaganda work of your department?—I remember something about that.

29765. How can you explain this trend of the evidence of the witnesses who came before the committee in 1922 if you say that the public of the Province are to a certain extent impressed with your demonstration and propaganda work?—Perhaps we have impressed the people who are working in the fields more than the kind of people who give evidence before committees. They belong to different classes. One man comes to give evidence and another man lives in his village and it is the latter man whom we touch.

29766. You have had experience of the Agricultural College before its affiliation to the University. Now that it has been affiliated to the Nagpur University, what changes do you find?—It has been affiliated for only a year and a half or two years; I cannot say that I see any enormous change, beyond that I see a greater tendency to join

the college, to begin with. There has been an increased number of applications for admittance to the College, probably two to three times more than formerly.

29767. It has therefore had a marked effect?—It has had this effect, that it has increased the number of students seeking admittance; it gives a stamp, and a University stamp is different from a diploma in agriculture, and after all it is more valuable in many directions.

29768. Who are the members of the Faculty in Agriculture?—They are heads of the sections of the Agricultural College and about three outside gentlemen, who are landowners.

29769. That constitutes the faculty?—Yes; it is a small faculty of about ten or twelve.

29770. You do not have any post-graduate training here?—No; no post-graduate training in the University.

29771. It is a two years' course?—No; it is a four-years' course.

29772. For two years you give a certificate?—Yes.

29773. And after four years you give a diploma?—No, a degree.

29774. You have stated here that you attach a good deal of importance to practical training. Before referring to that I want to ask you one or two questions on theoretical training. Take, for instance, agricultural chemistry; do you follow any particular text-book?—No, we do not follow any particular text-book.

29775. Do you follow any text-book in botany?—We have no standardised text-books anywhere in the College. The text-books which we suggest are the ones which the students may look at. In agriculture, for instance, I direct them to such books as should be read, but there is no text-book on agriculture in the College.

29776. Not even in agricultural economics?—No.

29777. Apart from the practical work that the students do on your college farm do you have any arrangement to give them working facilities on Government farms?—No. Do you mean after they finish their course?

29778. Do they have any practical work on Government farms as part of their training?—We give them about 10 to 12 hours' training a week in practical agriculture during the first two years and 6 to 7 hours' training a week in the last two years. We have no fixed period of training on a Government farm.

29779. On the question of economics, is there any method of farm costings introduced in your experimental work?—Yes; cultivation records, accounts and things of that sort are kept.

29780. Are these accounts kept by the advanced students themselves?—No; the students have not got to do anything of the kind you refer to.

29781. Do your students visit other institutions?—The second year students go round to one of our sugarcane farms; the third and fourth year students also go out on a short tour of the farms each year.

29782. Do they go to Coimbatore or Pusa?—The third and fourth year students went to Poona this year for a change, but they generally go out to some of our own areas.

29783. You confine your visits within the limits of the Central Provinces?—Yes; it is a question of finance.

29784. Do they visit any of the irrigation works of the Province?—When they were down in your rice tract, they went out to the Mahanadi irrigation works there, but it is not a regular visit.

29785. You do not make it a sort of annual or a part of a regular programme?—No, it would add too much to the expenses of touring. We used to have a fair amount at one time, but we had it retrenched, and one of our lines of retrenchment was cutting down the amount of money that could be spent on touring; we could with advantage increase it at the present day.

29786. It would be an advantage for an agricultural graduate to know something about the Irrigation Department and their activities?—Yes; we could give him that knowledge by means of lectures. I do not know whether he would learn much by looking at water flowing over a weir.

29787. Do the students visit your chief marketing centres, for instance, the cotton or rice marketing centres at Akola, Nagpur, Raipur?—No; we have not made much of taking them round these marketing centres.

29788. What precisely do you teach them when you teach them agricultural economics?—That is rather wide.

29789. What are the general subjects you deal with?—I deal with the management of land, labour, sources from which capital is derived, a combination of these factors, production, and the general question of the distribution and marketing of the crops.

29790. You have already told us about the short course that you have here for the subordinate revenue officers?—Originally, the course was for senior officers, not for subordinate officers.

29791. It was not for subordinate revenue officers?—No; it is only latterly that a certain number of them have been included for the course.

29792. At the present time, do I understand that there is no arrangement whatsoever to give this course to the subordinate revenue officers?—There are no real *pucca* arrangements; there is not an annual course or anything of that kind.

29793. And neither is there any arrangement for the co-operative officers, the Circle Officers?—There is nothing beyond the fact that we occasionally give lectures to them when they have their own meetings; to give a few lectures at their gatherings.

29794. I think you have a number of teacher training schools in this Province?—Yes, we have the normal schools.

29795. Do those teachers pay a visit to your farm?—Occasionally they do so; the students in the normal school in Nagpur do so, and in other places, when they are near to another Government farm they go there. In most places where we have a Government farm there is a normal school.

29796. If suitable short courses could be arranged, do you think you have adequate facilities in your College for training the co-operative officials, the normal school students and the subordinate revenue officers?—We should have to increase the staff; at present my staff is fully worked.

29797. Given the staff, you can do it?—Yes.

29798. Have you a college council?—No.

29799. Does the teaching staff often meet?—Very rarely; they do not meet officially.

29800. What fundamental research is being carried on in this institute in Nagpur?—Investigation of the soil, soil moisture, and nitrates.

29801. In Pusa, Dr. Harrison is engaged in some of the problems; I want to know whether you are carrying on any fundamental work here which is not being carried on in the Central Institute at Pusa?—I am sorry I do not really know in detail what they are carrying on at Pusa. We are not in very close touch with Pusa; we do not have much to do with them.

29802. About your suggestions for a central organisation, would you agree with me that the activities of other departments such as the Departments of Co-operation, Education, Public Health and Irrigation, have a direct bearing on the agricultural progress of India?—Centainly the Veterinary Department and the Co-operative Department have.

29803. You would include irrigation?—Yes.

29804. Would you not include, for instance, the Education Department?—That would make practically every department of Government; they are all working for the same end. You would make it too big if you include all that.

29805. You would include the Co-operative, Veterinary and Irrigation Departments; and you think that these three departments have a direct bearing on agricultural progress?—Yes.

29806. Would you include their representatives on the Central Advisory Board?—No, I do not think I should, if you were to stick to the subjects which I have suggested that these committees should deal with. If you increased the number of bureaus or sections it might be necessary.

29807. On page 200, you have given statistics about the occupations of the students that have passed through your hands. You say they are employed "In other Government departments in the Central Provinces." What are the departments?—In the Revenue Department, and one of them is in the Education Department.

29808. What proportion of these boys has had opportunities for practical agriculture from the financial point of view, if thay wanted to go in for agriculture?—A great number of them would not have had the money; that is where the trouble was. In the early days we got sons of poorer men with holdings of 20 to 25 acres. A large number of them are agriculturists, but a great number of them have no financial backing.

29809. If they had financial support, this number of 30 engaged in private farming would have perhaps increased?—Yes, distinctly.

29810. Could you tell us something about the agricultural associations? What is their composition?—They are really the leading practical agriculturists of that particular tahsil. You have first the District Agricultural Association, then the Tahsil Association, and then the Circle Association; the circle is the Revenue Inspector's circle. They are only developed to a certain extent in the northern part of the Province at the present time. The District Association consists of men selected from the big men; the Tahsil Association is somewhat on the same lines; the idea of these smaller associations is rather to get hold of practical agriculturists who are unable to open their mouths in anything like a big association.

29811. Who runs them?—We run them. We have got our Agricultural Assistants. They go round and work them with the aid of the people.

29812. You have an officer in the circle?—There is the Agricultural Assistant in the tahsil, and he has perhaps two or three of these associations under him.

29813. Would you like to have demonstration plots attached to these associations?—The ideal would be that each association should have its own seed producing centre.

29814. You suggest the introduction of cassava as a new crop; is there any great scope for it?—I do not think there is great scope for it. I only suggested it as a high food producing crop which I have grown on the college farm in the early days; it produces a large quantity of stuff.

29815. *Sir Ganga Ram*: Is it produced anywhere else in India?—It is produced in Southern India.

29816. What do they call it?—I know it by no other name than cassava.

29817. *Prof. Gangulee*: Your experiments here in connection with cassava were successful?—Yes.

29818. You did not try it on a field scale?—No; I tried it only on a half acre plot.

29819. Do you think that there is any prospect for ground-nut?—I think there is considerable prospect for ground-nut, primarily in the cotton tract.

29820. Are your experimental farms in the cotton tracts carrying on experiments to see if ground-nuts can be introduced?—The crop is grown on all the seed and demonstration farms and also at Akola.

29821. In answer to the Chairman, you said you had seven Assistants?—There are seven directly associated with the agriculture of the College.

29822. And they do not carry on any research whatsoever?—No, there is no time.

29823. They are not capable of carrying on any research, even if they had time?—They have all done a certain amount of what I might call investigation work rather than work of research, but it has never been much in evidence, not because of their not being able to do it but because the men have not had time to give attention to it. They do work in connection with crop improvement and things of that kind, but it is not serious because there is no time for it.

29824. *Mr. Calvert*: I gather that the export tax idea is pretty dead, and I will not follow it up any further?—I have nothing more to say on it.

29825. You do not support the idea of an export tax, after your discussion with Sir James MacKenna?—I do not*.

29826. Do you teach your students on the rural economic side that an export tax might do any good?—I do not call it a tax, at the rate of an anna on a cwt.

29827. At the rate of 3 or 4 annas a cwt. it will come to Rs. 2 an acre given a 10-maund crop?—I was thinking of crops like linseed and other crops of higher money value.*

29828. You do not believe that the export tax would reduce internal prices?—An anna on 100 lbs. of wheat is not going to make much difference.

29829. I gather that nothing is being done with regard to fruit and vegetables?—Nothing really.

29830. While you have been able to get a Second Botanist for cotton?—Yes; he is paid by the Indian Central Cotton Committee.

29831. Is it a safe guess that the export crops are receiving more attention than crops for internal consumption?—They are, I suppose; the main staples are naturally receiving greater attention. If you have got only a comparatively small area of fruit and vegetables and things like that, I think they must give way for the time being.

29832. In this Province of very petty cultivators, is much being done on the crops which respond to intensive cultivation such as fruit and vegetables?—Generally speaking, as a department, we have not tackled what you call petty crops.

29833. The various departments we have seen so far seem to me to have ignored the food of the people and concentrated too much on the export crops?—A greater part of the rice grown in this Province is eaten in the Province, as also *juar* and wheat.

29834. You have not got a whole-time Botanist on rice or on wheat?—No.

29835. But you have one on cotton?—Some one else finds the money for him.

29836. But no one finds money for the food of the people?—The Government is finding money; one man is engaged for all these things.

29837. Have you any figures which would let us know the rough cost per student graduated from this College?—It is about Rs. 700 per annum.

29838. That is, roughly, Rs. 3,000 for the course?—Yes.

29839. And most of those do not take to farming on their own account?—Very few do.

29840. Can you explain why agricultural education, alone of all types of education, does not result in a student practising what he has been taught?—Because in many other cases, medicine or engineering for example, he does not require much capital to start with. An engineer or a doctor begins on a very small scale and he succeeds in getting a practice. But in agriculture it is purely lack of capital that prevents the great number of men taking it up. We have cases of students who join the department and then, after serving for some time and securing some capital, they go back and do farming on their own account.

29841. Do you think that one reason may be that your curriculum is not adapted to the agriculture of the country side?—I think it is adapted.

29842. But you are not teaching them how to bring money out of 10 acres?—No.

29843. The typical size of the holding does not control the curriculum?—No.

29844. You think that is correct?—The general agricultural curriculum applies naturally to the 10-acre holding. But what I am arguing is, if a student returns to the land after a four years' training, he cannot get an adequate return from 10 acres for what has been spent on his training.

Vide Appendix I.

29845. Could you get a good living on 10 acres of intensive cultivation?—Yes; if you have money and dig wells and produce good crops. Nearly all our land is unirrigated. Our average yield per acre is very low when compared to that in other Provinces.

29846. Does your Court of Wards employ your B. Sc's. in Agriculture as managers?—We have had applications from the Court of Wards for these men just recently and a few have been employed; but these appointments are not very stable. After a time the Court of Wards may give back the estate and the man may be pushed out so we are trying to lend them men from our own department.

29847. It is a possible opening for the student?—Yes.

29848. Surely if he could find employment in the Court of Wards he might ultimately become a good land administrator?—Yes, if he gets the opportunity.

29849. You put land improvement as one of the causes of agricultural indebtedness?—Yes, as one of the causes of borrowing.

29850. Do you think that it is really a cause of borrowing to any great extent?—Yes, to as great an extent as that for unproductive purposes.

29851. Is this answer here based on any detailed enquiry into borrowing or is it a general opinion?—It is a general opinion based on conversations with people. It is not based on any systematic enquiry into the sources from which money has been borrowed.

29852. Has any enquiry been made into the causes leading to mortgages?—No; no enquiry has been made.

29853. Your opinion that mortgage "supplies an efficient business farmer with the means to secure working capital" is not based on any enquiry?—It is based on general knowledge; my own experience is that that is so in other parts of the world.

29854. In this Province, do you think really there is mortgage, to any extent worth mentioning, to secure working capital?—The difficulty is that most of them spend on unproductive purposes or they are much in debt.

29855. Two remarks which you make seem more or less inter-connected, one that malguzars look for their income to loans made to their tenants?—Yes; a considerable number of malguzars do look for their income to the loans made to tenants.

29856. Later on you say that money is invested in land but very few do so with the intention of farming?—They invest in land but a good deal of it is leased; they invest in the village but they do not carry on much home-farming on it.

29857. The necessary inference that strikes me is first that moneylending pays better than agriculture?—I think it probably does.

29858. And that the ownership of land is more profitable than the cultivation of it?—But I think cultivation could be made profitable.

29859. Have you taught them intensive cultivation?—No.

29860. Here you mention about the cost of seed in the case of *berseem*, and in the memorandum you mention about the cost of seed in the case of wheat. Do you think the cost of seed is a deterrent on the expansion of wheat and *berseem*?—I think it is the chief deterrent. Irrigation is not sufficiently plentiful to irrigate much of cold weather crops; but I think the price of seed would tend to deter persons from starting them. Unless one has got very valuable cows, it does not pay him to grow *berseem*.

29861. This morning I think you told me that the gross outturn of wheat might only be six times the seed?—Yes, in the north of the Province.

29862. What would be the proportion in the case of *berseem*?—It is purely grown for fodder; you can get 20 tons of green food on one acre of *berseem*.

29863. What is the proportion of the seed as against the value of the crop?—The value of the crop would be Rs. 120 per acre.

29864. And how much for the seed?—About Rs. 20.

29865. You say a large percentage of the bigger landowning class takes no interest in agriculture, while in the memorandum it is repeatedly stated that the propaganda and demonstration are directed towards the bigger landowning classes?—A large number of landowners do not take interest; if there were more landlords taking more interest we should make more progress. There are, of course, certain people, malguzars and others, who do take interest and our efforts with our limited staff are directed towards them. All the same, there are a large proportion in the northern districts, certainly in the Chhattisgarh Division, who take little or no interest in agriculture.

29866. You make the statement here that the bigger landowning class takes no interest in agriculture, and yet repeatedly the bigger landowners are referred to in the memorandum. Why concentrate your efforts on classes which you describe as practically useless?—We do not concentrate on these bigger landlords. But there are big landholders in the north of the Province and other places.

29867. Why should not demonstration and propaganda be directed towards the people that live from the soil?—The demonstration is carried out in the villages too. If by this you are led to understand that we are only concentrating on the bigger landholders of the Province and do not look to the smaller cultivator, then you are led entirely astray by this memorandum.

29868. In the memorandum the poor cultivator does not get a hearing at all?—I wish to contradict that; a great deal of work is done to help the cultivator. In some parts of the Province, if we had to depend simply on what we got from the landlord, we should never get anywhere.

29869. You are really getting at the actual cultivator who lives on his crops and not at the man who lives on what he makes by moneylending?—No, that man does not take any interest in agriculture; he does not even come and look at it

29870. *Mr. Kamat*: You must be familiar with the economics of the cotton crop in Berar, and you know to what extent it pays per acre in normal years with normal prices?—I would not like to give figures straight away as to exactly how much it pays; the prices have been so up and down in recent years with regard to both expenses and returns. This year has been a dead loss.

29871. I say in normal years of rainfall and with normal prices: say the prices of this year, which I am told are very low?—In this year I should say in most cases it is a loss. At the present year's prices and expenses, the expenses being practically those of last year, cotton growing would not pay carried on under present conditions; there would have to be a reduction of cost. Labour prices will undoubtedly fall during the coming year.

29872. Taking the last two or three years' prices, it would pay?—Yes, undoubtedly; it must pay: the acreage which has gone into cotton of recent years shows that it does pay.

29873. Cotton is the principal crop of this Province. Have you worked out how much it pays per acre, taking the prices of the last two or three years?—If you give me a little time I could work it out and let you have it, but I have not the figures now.

29874. You cannot give me a rough idea as to how much per acre cotton pays?—No, prices are so varied; I can work out the rough idea and let you know.

29875. Very well. You say that agriculture is not popular because the standard of living of the student class is higher than that of the cultivator class, and as farming returns now stand a man of the middle class finds it difficult to make a living and provide for his needs?—Yes, his standard of living is higher than that of the cultivator in the village.

29876. When students pass through your college and enter Government service how much per month on an average satisfies them as a starting salary?—The Certificate class get Rs. 50 per month, and the others get Rs. 70.

29877. What are the prospects of graduates of your college in Government service? Will they be satisfied with, say, Rs. 300 a month ultimately?—A good number certainly would not look for more than that.

29878. That is an index to the standard of living which they themselves expect, Is that right ?—Yes, I suppose so.

29879. If they expect a starting salary of, say, Rs. 50 a month, which means Rs. 600 per annum ?—Yes.

29880. Now coming back to the cotton crop and its yield per acre, could you give me an idea as to how many acres would give him that Rs. 600 per annum to start with ?—About 15 to 20 acres I should think would give him a gross Rs. 600.

29881. If you turn to page 51 of the *Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar* (*see* page 21 above) you will find that in describing the outlines of the Degree course in your College, it is said : " The second year practical agriculture apart from the time given to agricultural engineering, takes up about ten and a half hours per week in three periods." Then there is a description of how the students are encouraged to carry on practical agricultural work on plots of 10 to 12 acres ; " work is done co-operatively under the supervision of an assistant. The land, implements and bullocks are supplied by the principal as landlord. The class undertakes to make certain returns of fodder crop and to carry out land improvement in lieu of rent. . . The field work is done by them and they take the profits In favourable years as much as Rs. 470 have been received." In reply to my colleague, Mr. Calvert, you said that a 10 acre plot would not be suitable for an average student ?—The area on the College farm which is laid out for this particular work is a 10 to 12 acre field ; it is laid out on the lines of a small farm of about 8 or 9 fields ; it is kept to that area partly because I have not got time for the class of work on bigger areas ; I cannot occupy their time too much on this kind of manual work, so that I keep the area down to 10 or 12 acres, which is as much as they can work in the short time they have at their disposal per week.

29882. That is a matter of detail ; the fundamental fact remains that, on an average, assuming they have the land from the principal as landlord, they do make some profit ?—Yes. The Rs. 470 was in a very good year.

29883. Rs. 470 is an extreme figure, but on an average they make some profit ?—Yes, every year they get money.

29884. The object of teaching them agriculture is to enable them to do better farming, more intensive farming, than the average cultivator who has not received an agricultural education ?—That is true.

29885. So that surely, if you have given the right kind of education, the agricultural graduate must make more on 10 acres than the ordinary cultivator ?—Yes.

29886. Putting those two things together, cannot they make Rs. 600 per annum to start with when you send them out from your college, if, as you say, cotton pays ?—Yes, I should say so.

29887. You see what I am driving at ?—Yes ; if they have got a sufficient area of land to work on, I should think they could make Rs. 600.

29888. Then how does this proposition stand, that agriculture is not popular because the middle-class student cannot make enough for his standard of living ?—Rs. 600 is apparently going to be the limit, is it not ?

29889. No that is the beginning ?—They have only that area of land ; unless they are going to have more capital to buy a larger area of land, or can secure the land in some way their income is going to be limited to Rs. 600; there is not much prospect of extension when the child comes and there are the additional expenses incidental to the family.

29890. Do you mean that if they do more work they will not be able to make more money than the average man ?—Yes. They can raise a little more, perhaps 5 or 10 per cent, but the area is small.

29891. What is the minimum area that would be adequate to enable an educated graduate to make a decent living ? Would 20 acres be the least ?—Quite the least ; I should not like to do it on 20 acres on most of the dry cropping in this Province ; except on very good soil you would probably want, I should think, about 50 acres. I am not now speaking of an irrigated tract; in an irrigated tract under the irrigation canals you could get along with considerably less, but talking of the dry tracts of this Province I should say you would want 50 to 60 acres.

29892. Then, if the agricultural graduate leaving your colleges wants to do farming, he cannot subsist on less than 50 acres of land?—No.

29893. Small cultivation would not be of any use to a man who wants to take agricultural training?—Yes, that is what I am trying to impress on students who come here; if I ask a student how much land he has got, and he says he only has 20 or 25 acres, I tell him it is not worth his while to take a four-year course; the two-year course would be sufficient.

29894. And whatever intensive cultivation he may do by his special knowledge, if it is only a 10 acre holding, it is not worth his while to take the agricultural course?—No, on unirrigated land.

29895. In your memorandum you emphasise the fact that imported implements are hardly suitable for the Indian cultivator?—Yes, a great deal of the imported implements, as they are, are not suited to the Indian cultivator; they are too delicate.

29896. The imported implement, designed as they are, are unsuitable for the illiterate cultivator of this country?—Yes, I say that most of the modern improvements of the last twenty years have been devoted to small details which tend to help the working of the machine but add to its delicacy and do not affect the fundamental part.

29897. If, therefore, your opinion is right, I think it follows that it is no use teaching the people that their agriculture does not pay because they do not use modern implements, because those modern implements are not at all suitable?—No, you have understood me wrongly; the principle of the modern implement is right; it is the actual machine which is unsuitable.

29898. The cultivator needs an improved implement, but the implements which are placed in his hands are not suitable?—As I say, a great number of the improvements are improvements which are too delicate for the purpose. I think I gave an example in the case of ploughs; a plough such as is made by Kirloskar has all the fundamentals which are needed; as compared with the Meston plough it is heavier, stronger, and, if I may use the word, a coarser implement which it is not so easy to work with; if you give the ploughmen on our farm the choice, they will at once take an imported implement, because it is easier to handle and they are more or less skilled labourers; but in the hands of an unskilled labourer these details, which help the skilled worker, are apt to get out of order.

29899. *Prof. Gangulee:* Does the inversion plough work satisfactorily?—Yes, it works perfectly all right. But if you take the average machine which you see in a Western Show, the sort of thing that a firm might import with the intention of trying to sell it in this country, it is very often delicate in the sense that it has been developed to a higher standard than the ordinary Indian ploughman can use.

29900. *Mr. Kamat:* Therefore, in order to make agriculture pay with the kind of implements which are suited to the country, side by side with other things you require an agency in this country to manufacture implements suitable to the intelligence of the cultivator; is that right?—Yes.

29901. That problem has not yet been solved?—First of all, you must have a man to design the implement; that is where the Agricultural Engineer comes in and we have had very few Agricultural Engineers.

29902. This problem has been neglected by most of the Local Governments has it?—Yes.

29903. *The Chairman:* Who teaches animal husbandry in the College?—One of my staff who was trained in the College itself and has since had two years training in dairying and animal husbandry at Bangalore.

29904. Is he demonstrating the use of the silo?—That is demonstrated at the College dairy farm where we have two pit silos and one tower silo.

29905. Is it in use at this moment?—Yes.

(The witness withdrew.)

APPENDIX I.

A Note on Export Cess.

Question 29825. You do not support the idea of an export tax, after your discussion with Sir James MacKenna?

Answer. I do not.

To make my views clear, I desire to state that I favour small cesses on the exported agricultural products of this country. I believe that if kept small and governed by the quantity and relative values of the products that these would not affect the prices obtained by the grower.

If they did so, the reduction in value to the grower would be extremely small per acre and would but represent a co-operative financing of efforts to improve the outturn, quality and money value of his crops. A cess levied on export appears easier to collect than one based on the acre and at least allows of the possibility of part payment by others.

Question 29827. At the rate of 3 or 4 annas a cwt. it would come to Rs. 2 an acre, given a 10-maund crop?

I consider that the inference which may be drawn from this last question is likely to be misleading.

(*a*) It assumes that 3 or 4 annas per cwt. was specified for wheat in my answer to the questionnaire. This was most certainly not the case in regard to crops like rice or wheat, in which the amount grown and exported is considerable.

The higher cesses were suggested for the more valuable commodities or for commodities such as bones, which might be better left in India, if we can assume that such a small export cess as was suggested would affect export adversely.

(*b*) It suggests that the cess would bear on the cultivator of wheat more heavily than the land revenue does.

This is misleading.

In making this statement—

(1) The highest cess is assumed. At an anna per cwt. the charge would be 7 annas

(2) The whole of the 10 maunds crop is taken as contributing to the cess, whereas from any individual acre only that portion which corresponded to the fraction of the whole crop, as is exported, should be taken in estimating the pressure of such a cess on the individual acre.

My suggestion was on the exported grain only, not the whole crop.

Approximately this is about ·06 of the whole crop. In other words, the pressure of the cess on the produce of one acre of wheat can only be calculated on 800 × ·06 lbs or 48 lbs.

At the rate of 1 anna per cwt. of exported crop this would cost the individual acre, assuming that the grower had to meet it, which I am not prepared to admit, distinctly less than half an anna and not Rs. 2 as the inference implies.

I attach a statement which I had prepared when writing the answers to the Questionnaire, but which I did not include, as it appeared too detailed, and as the actual rates required to make the cesses equitable demanded more time and data than I had at my disposal. The table will, however, provide a rough guide as to the income which might be derived and to the pressure on the individual grower, if it is proved that he would pay for the service so secured.

MR. R. G. ALLAN.

Statement showing possible application of Export Cess.

Object under cess.	Total area cropped (in thousand).	Approximate yield (in thousand).	Approximate export (in thousand).	Proportion of export to yield.	Cess per cwt. or bale.	Approximate research contribution.	Average yield per acre.	Approximate gross crop valuation per acre on primary market quotations.	Proportion of crop per acre contributing to cess and paying at cess rate per cwt. or bale.	Incidence of cess per acre as possibly adding to cost of production.
1	2	3	4	5	6	7	8	9	10	11
Cereals—	Acres.	Tons.	Tons.		Annas.	Lakh Rs.	lbs.	Rs.	lbs.	Annas.
Rice ...	80,000	31,000	2,260	·073	½	14·05	850	82	62	·25
Wheat ...	31,000	9,400	545	·058	1	6·87	840	52	49	·43
Oilseeds—										
Linseed ...	2,300	510	346	·67	1	4·32	460	41	308	2·7
Rape ...	4,000	1,172	310	·26	2	7·75	510	45	132	2·20
Ground-nut ...	2,330	1,038 (831)*	327	·39	1½	5·80	980	95	353	4·65
Sesamum ...	5,270	488 bales.	36 bales.	·074	3	1·35	269	33	18	·48
Fibres—										
Jute ...	2,700	7,950	700	·087	¾ 6	2·62	1,160 (2·9 bales.)	159	101	1·50
Cotton ...	25,000	5,700	3,450 tons.	·60	4	8·60	104	*42	62	·62
Animal produce—										
Bones ...	...	...	6,700	...	4	2·62	...	...	...	...
Hides ...	...	...	68,800	...	8	6·80	...	...	...	...
						60·78				

**Vide* Note on page 240.

Note on attached table.

Cereals.—The cesses suggested on exported rice and wheat provide incomes roughly proportional to the areas under the two crops.

The figures giving the pressure per acre are low as the resultant of the low proportion of export to yield and the utilisation of a low cess rate.

Oilseeds.—In oilseeds the pressure rises except in sesamum, partly on account of the greater proportion of crop exported and partly because a higher cess is suggested on crops which make a greater demand on soil fertility.

The higher acre incidence in ground-nut is neutralised by the greater average gross value of the outturn per acre. The oilseeds, except sesamum, are thus practically alike.

Fibres.—The suggestions in this group on the table are based on export. It might be more equitable to substitute a cess on total bales produced rather than on bales exported. At 1 anna per bale the income on jute would be doubled and the pressure per acre would be 3 annas, bringing it into a more equitable position when the value per acre is considered.

A cess of 4 annas per bale on cotton would provide about £4 lakhs. The pressure per acre would be an anna.

The approximate figure of Rs. 42 in column 9 against this crop is arrived at by averaging the prices of this season and last for different grades and accepting 104 lbs. as the average yield. When taken into consideration with the greater value of jute per acre, the incidence on the cotton grower appears reasonable.

Cotton in view of its importance, the amount of investigation it demands and the area planted, should provide a relatively large proportion of the general income.

Animal products.—The cesses on bonemeal and hides are suggested as means for providing for research in animal nutrition and in livestock improvement. The cess on hides in view of their high value per ton could be increased.

I have not the data to analyse the bearing of these suggestions on individual Provinces, as judged by the ratio of crops exported by each. If the cesses on the crops are eventually borne by the growers this would give the amount contributed by the growers of each Province to the central fund. Judging, however, by the crops selected, by their specialisation to fairly marked tracts, as the outcome of climate, soil and trade development, and by the amount of cess suggested, I think it will be found that the contribution to a central fund will be reasonably balanced. The contribution from rice from Burma will be balanced by the contribution from cotton by Western India, and the greater wheat export of Northern India by the greater export of ground-nut from Madras, and so on.

Though I believe that at least a fair proportion of the total income will be derived from the consumers overseas and the trade, I do not think that the final source which provides this income is a matter of great concern. What appears to me essential is the existence of a definite fund for the furthering of general agricultural research and the special improvement of the country's chief staples. Further, that this fund should be centrally controlled by an unbiassed body for the fulfilment of these objects in India as a whole.

I look on the fund, whether it be regarded as contributed by the crops and other items on the table or contributed by the Provinces from which exported, as a co-operative fund for the advance and improvement of the agriculture of the country. I do not suggest that all the revenue contributed, for instance, by wheat shall in any one year be spent on wheat or that all the money coming in from the exports of any one Province shall of necessity be returned to that Province.

MR. R. G. ALLAN.

APPENDIX II.

Cotton Cultivation.

Area and cropping.—In the typical cotton tract 15 to 25 acres of good cotton land is managed by a pair of medium-sized bullocks (costing Rs. 175—200). So an area of 21 acres may be said to be a fair unit for a pair. This area would normally be divided into three blocks, two carrying cotton and *juar*. With the cotton there would be a few lines of *tur*. Cotton is the money crop, *juar* supplies the major part of the cultivator's grain needs and the *kadbi* feeds his bullocks.

Assuming 2,000 lbs. of *kadbi* per acre and 40 lbs. as the requirements of a pair, this area meets all the fodder requirements of the pair which cultivates the whole 21 acres.

Assuming that the *juar* crop is primarily for grain and that the *kadbi* is a bye-product, the actual fodder requirements of his bullocks cost him nothing.

An estimate of a *khandi* of cotton seed per head supplies 4 lbs. concentrates per head for practically 200 days, which may be taken as the period during which the animal is in work of such a nature as to make feeding with concentrates necessary. A *khandi* of cotton seed costs between Rs. 24 and Rs. 30. The concentrates of a pair may be thus placed at Rs. 54. To this should be added Rs. 20 depreciation, Rs. 10 interest and Rs. 16 for incidentals, salt, implement and harness replacement. Thus Rs. 100 may be taken as the actual cost of a pair.

Actual work associated with a farm of this size would not exceed 150 bullock-pair days of this single pair. On this basis a day's work on the farm is worth 10 annas and 6 pies.

The rotation practised is regulated by the probable price of cotton as estimated on the price prevalent in the local market during the earlier part of the hot weather.

Ploughing.—A good *Kunbi* cultivator reckons on ploughing his land once in five or six years about 5 to 7 inches deep.

If the ploughing is done in January or February two pairs of bullocks are hired for this, while if it is done in April or May (which is rare) three pairs must be hired.

About 0.4 acre of land can be ploughed per day 6 inches deep during January or February and 0.3 at the later date. The cost of bullocks hired for the plough is Rs. 2 per pair per day.

The cost of ploughing in, say, February comes to Rs. 5-8-0 per day or, say, on 2½ days' work, an acre costs Rs. 13-12-0 assuming all hired.

Manuring.—The vast majority of the area under cotton does not get manure. Of the excreta dropped, probably only half is voided in the sheds. Of that voided in the sheds, normally about two-thirds is used as fuel and the balance voided during the rains finds its way on to the land. A really good cultivator needs to manure his land once in six years, applying as his dressing 16 loads of about 800 lbs. each per acre. This costs about Rs. 1-12-0 per load or Rs. 28 per acre on a hiring basis.

Thus, combining deep cultivation and manuring done once in six years, manure Rs. 28, ploughing Rs. 13-12-0, total Rs. 41-12-0, or an annual charge of Rs. 7 per acre per annum, all hired, but less in proportion as he uses his own bullocks and labour.

The combination of rotation, manuring and ploughing, would work out as below :—

	Blocks.		
	A	B	C
1927 ...	Cotton	Juar P	Cotton
1928 ...	Cotton	Cotton	Juar M
1929 ...	Juar P	Cotton	Cotton
1930 ...	Cotton	Juar M	Cotton
1931 ...	Cotton	Cotton	Juar P
1932 ...	Juar M	Cotton	Cotton

P = Deep work. | M = Manure.

Manual labour.—8 annas may be taken as the cost of a man per day. This hired labour cannot be said to work more than 7 hours per day. The cultivator working for himself does a heavier day and covers more. Judged, therefore, by the former standard his work costs less per day, say, from 5 to 6 annas. Again we may eliminate his wages on a daily basis and show them as part of his profit.

The figures given below are thus set out in four columns of cost, in accordance with the conditions heading such column:—

Operations.	Labour and bullocks hired.	Hired labour, but own bullocks.	Himself wages estimated.	Himself wages as profit.
1	2	3	4	5
	Rs. a.	Rs. a.	Rs. a.	Rs. a.
First bakharing ...	1 8	1 4	1 2	0 12
Stubble removal ...	0 12	0 12	0 10	0 4
Second bakharing (May) ...	1 2	0 14	0 12	0 8
Third bakharing (Rains) ...	0 12	0 10	0 9	0 6
Sowing, using bakhar and sartas.	1 0	0 12	0 10	0 6
Light bakharing after sowing	0 10	0 7	0 6	0 4
Cost of seed and preparation	0 12	0 12	0 10	0 8
First hoeing ...	0 12	0 10	0 9	0 6
First hand-weeding and thinning (12 women at four annas per day).	3 0	3 0	2 8	2 4
Second hoeing ...	0 12	0 10	0 9	0 6
Third hoeing ...	0 12	0 10	0 9	0 6
Second hand-weeding (eight women per acre).	2 0	2 0	1 8	1 4
4th and 5th hoeing (rare) ...	1 8	1 4	1 2	0 12
Proportion of watching ...	2 0	2 0	...	...
Picking, 280 lbs. at 6 annas a maund.	3 12	3 12	1 10	1 0
Marketing ...	1 4	1 1	1 0	0 12
Land revenue ...	2 8	2 8	2 8	2 8
Increment of ploughing and manuring.	7 0	6 0	5 8	5 3
Total cost per acre ...	31 12	28 14	22 2	17 13

NOTE.—Hired labour for weeding is not infrequently 6 annas per day. This would raise costs by Rs. 2-8-0 in the first two and by Rs. 2 in the last two columns.

A man has been taken at 8 annas per day. This is approximately correct for labour at present, especially if permanent, but has been as high as 10 annas per day. This would increase cultivation cost under the first two by Rs. 1-6-0 an acre and that under the third by 14 annas. An employer of labour using his own bullocks might thus easily have paid Rs. 32-12-0 per acre and the small ryotwari cultivator, estimating his labour cost at the lower figure used in column 4 would have spent Rs. 25 per acre.

The rental has been put above at the revenue figure. Land, however, is not infrequently sublet for 5 or 6 times this figure, raising the cost, in particular to the type farming under columns 4 and 5, to Rs. 30 or more per acre.

Income.—The annual return per acre, allowing that advantage derived by manuring, averages from 280 lbs. to 300 lbs. *kapas* per acre.

Prices have fluctuated.

In 1925-26 it was in the neighbourhood of Rs. 125 per *khandi* of *kapas* and at this figure an average yield gave from Rs. 45 to Rs. 48 per acre. A large grower, as in column 3, secured a profit of Rs. 12 to Rs. 15 per acre and the smaller man doing his own work, as in column 5, a labour wage of Rs. 25 per acre, or less, in proportion to his personal effort.

In 1926-27 the price was nearer Rs. 88 per *khandi*, and the return per acre was Rs. 31 to Rs. 32, while wages had been on a high basis due to cotton prices of the season before and due to a distinct tendency of the class in column 3 above to increase at the expense of the classes in column 4 or 5. In a number of areas the yield was well below the average thirteen anna crop taken above. Under these conditions profits were either small or entirely absent.

It is doubtful whether cotton cultivation would pay with the price of *kapas* at less than Rs. 100 per *khandi*, except under soil conditions of above the average yield.

MR. R. G. ALLAN.

RAO BAHADUR K. V. BRAHMA, B.A., LLB., M.B.E., President, Berar Co-operative Institute, Limited, Amraoti.

Replies to the Questionnaire.

QUESTION 2—AGRICULTURAL EDUCATION.—I was Vice-Chairman of the District Board, Amraoti, from 1916 to 1924 and have been the Director of the Amraoti Co-operative Central Bank from 1912. I am also the President of the Berar Co-operative Institute since it was started in 1923. In my capacity as Vice-Chairman of the District Board, I was in direct touch with the primary schools in Amraoti district and one of the first complaints that I heard from the agriculturists was that the education that was being given to boys in Board schools unfitted them for work in the fields. I also discovered that the curriculum was not designed even to create an agricultural bias in the boys living in villages. I therefore thought of introducing the practice of agricultural operations in village schools in the last two years. My idea was, if the dignity of field labour could be impressed on the minds of students in schools, a double advantage would be served. A distinct bias for agriculture should be created and the objection against sending boys to schools would disappear. I hit upon the plan of asking a well-to-do villager to keep one of his fields with a pair of bullocks, after the crops were taken out, at the disposal of school for three months from February to May. Two days in a week, the bigger boys in the school were to be taken into the fields and asked to work in the field with the harrow (*vakhar*) and do what is known in Berar as the summer preparation of the soil (*unal vaki*). Villagers were willing to supply this facility, but I found general disinclination amongst teachers to do this kind of work. My plan was also to take out boys in the weeding season to fields close by, to make them do the weeding and to explain to them the growth of plant-life and the importance of weeding in that connection. Field-owners would be willing to pay for the weeding and the money thus earned was to be earmarked for school picnics. I tried the experiment in some schools, but it did not succeed for want of proper kind of teachers. My answer to the sub-heads under this question is therefore as follows :—

(i) In Berar we have not teachers who can or will teach agriculture to boys in the beginning of their life. There are no schools for the teaching of agriculture in the moffusil. The existing primary and vernacular middle schools can be utilised for creating an agricultural bias and short courses in agriculture should, in my opinion, be attempted in places where we have experimental or demonstration farms. We are no doubt in need of higher education in agriculture and experts. But as in administration so in agriculture let us not be top-heavy. The need of the hour is the broad-basing of agricultural education and with that end in view the more the number of village folks we draw in the scheme of education the greater and speedier would be the progress.

(ii) Berar is wholly an agricultural tract with no other source of augmenting its material wealth. The shortage of rain and its unseasonal character of late years have forced people to think of the question of preserving soil moisture. The need of agricultural education is keenly felt and teaching facilities should be speedily provided for in Berar and I should advocate the starting of schools at some convenient place in each of the four districts of Berar. The course may be of a year or six months.

(iii) I would not insist on teachers being drawn necessarily from agricultural classes but as people just insist on a teacher being a trained teacher, I should insist that a teacher should have gone through a course of agricultural education before he is confirmed in his appointment in rural areas.

(v) The main incentive that induces lads to study agriculture now is the chance of securing good service in the Department of Agriculture or in the Revenue Department.

(viii) Nature study as it is done in schools now in villages is hardly useful. Neither boys nor teachers feel any interest in the subject as it is taught in the class-room. Nature study should be attempted out in the fields with special reference to crops grown in the villages and I should think school plots and farms would give better results.

(x) Middle-class youths would be attracted to agriculture in villages and even towns if agriculture is taught to them without being tiresome and if it is demonstrated to them that agriculture affords them maintenance in the same way as service does.

R. B. K. V. BRAHMA.

(xii) Adult education can be popularised by the use of pictures, cinemas and gramophones. I have seen a method in which instruction is conveyed through the eye and the ear more than the head and adults learnt alphabets in three days. We should try every means of visual instruction.

(xiii) The outline that I have given above shows that agricultural education of the rudimentary type in village schools need not be costly. My plan does not require any change in the administration. If the Department of Agriculture, the Education Department and the District Boards or Councils co-operate, better educational facilities could be assured in rural areas with an additional expenditure not exceeding seven to eight thousand rupees in a district per year. Two-thirds of this should be borne by the Government and one-third should be met by the local authorities like the District Boards or Councils.

QUESTION 3—DEMONSTRATION AND PROPAGANDA.—(*a*) Demonstrations and shows illustrative of the use of machinery, agricultural exhibitions and displays such as plough races have done a great deal in popularising the use of machinery. The facility of getting machines at cheap rates has also done a great deal in introducing the modern iron plough in place of the wooden plough. These methods have to be repeated several times before agriculturists begin to appreciate them. The chief difficulty in introducing machinery lies in the fact that in villages even ordinary smiths are not available and naturally cultivators refuse to buy implements which they cannot get easily repaired; and the remedy lies in establishing centres from where spare parts can be supplied and repair work done.

(*b*) Agriculturists believe that field demonstrations are mere shows and will not stand the test in every day life. The basis for this opinion, though largely erroneous, lies in the fact that the Department of Agriculture is not prepared to take up work and demonstrate how it can be economically turned out. For instance, it is maintained that the motor tractor is both better and cheaper but the department is not prepared to undertake ploughing by tractors on a large scale and show that ploughing by tractor can be done cheaper than by the old method. To ensure confidence, the department should take a certain amount of work on contract and do it at cheaper rate.

(*c*) Two methods which will certainly induce cultivators to accept expert advice are as follows:—

(i) That advice given by experts must be demonstrated to be beneficial. Cultivators may be illiterate but they are not ignorant. If an expert is willing to show that his advice will result in benefit even under the conditions which ordinarily obtain in villages, cultivators are bound to follow the advice. But what often happens is that the advice to be followed either requires larger expenditure or does not give certain results. Taking works on contracts and doing them cheaply is the surest way of convincing agriculturists.

(ii) The second method is, that the Government should pick up well-to-do men who can afford to take the initiative in adopting expert advice and reward these men by prizes. The hold of the village *patel* and *patwari* on the village is still very large and if these two local persons are encouraged to take active interest in new methods they will be able to popularise the advice of experts.

QUESTION 4—ADMINISTRATION.—(*c*) (iii) There is great dearth of roads in Berar and even tahsil headquarters are not connected with the district headquarters. Important and rich cotton tracts are not supplied with adequate roads. This is undoubtedly a question of money where permanent and *pucca* roads are intended. But village roads and roads to markets are neglected. Some sort of compulsion should be introduced by law on District Councils in maintaining roads, easing *nullah* approaches and filling up ruts. One of the scheduled duties of a village *Mahar* who is paid by a cess from the cultivators is to do petty repairs to all fair weather roads within their village boundaries. Revenue officers should exact these duties from them through the *patel* of the village. With the formation of District Councils this work is being neglected by the revenue authorities as appertaining to the District Councils and as the latter have not sufficient funds village roads suffer. "Good roads are cheap at any cost" and I should even advocate legal provision being made by which every adult male or female in a village should be compelled to supply a day's labour in a year for repair of village roads. A distinct policy should be laid down as to what roads should be constructed and maintained by Government and what by District Councils. A well-defined policy is necessary. The District Council should devote its funds on approaches to villages and bazars and Government should finance all main roads leading from

taluk to taluk and district to district. Maintenance of roads after construction should as far as possible be handed over to District Councils. Government would thus be able to save some amount of money.

QUESTION 5—FINANCE.—(*a*) The best and the safest way to finance agriculturists is to start village co-operative societies. No other method will succeed so well for short-term loans. For long-term loans, land mortgage banks on co-operative basis should be started. Government should come to the assistance of these banks by helping the floating of debentures and subscribing to them. An amendment of the Indian Trust Act in respect of the securities in which trust money could be deposited should be effected so as to allow that money to be deposited in co-operative banks. The Imperial Bank Act should also be similarly amended to permit that bank to put money in these debentures. The Conference of all Registrars of Co-operative Societies held in Bombay in January, 1926, has laid down the lines on which these banks should work and no time should be lost in giving effect to the resolutions adopted by the Conference.

QUESTION 6—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are :—

(1) Unexpected fluctuations in prices of produce.

Cotton rates differ from year to year and generally a cultivator frames his estimate of expenditure on the highest price fetched by his crop in the last season in the hope that his crop would fetch him the same amount again. Cotton prices depend on the world situation and as this cannot be controlled by local measures the only way to remove this cause of indebtedness is to preach to the cultivator the lesson that his expenditure must be based on the lowest rate and not on the highest.

(2) Careless disregard of income and expenditure.

Generally speaking, an agriculturist spends in expectation of income and seldom after collecting his actual resources. To prevent this, the importance of framing family budgets should be taught in the schools. Through co-operative societies and in the top classes of vernacular middle schools, an attempt should be made to show the advantages of family budgets and how easily they can be framed if attention is paid to this. Women of the farmers are thrifty and if attempts are made to start 'Thrift Societies' this cause of indebtedness may be remedied.

(3) Social customs which compel a person to incur expenditure disproportionate to his income.

This is a chronic evil and can only be remedied by continuous education and propaganda. Co-operative societies for curtailing ceremonial expenditure is a remedy well worth trying.

(4) Lack of credit facilities and general shyness of capital in going to the relief of agriculturists.

(5) Insufficient appreciation of the fact that agriculture like other industries requires floating capital.

It is the experience of every body that a cultivator is in need of money most between the months of June and August for cultivation, *i.e.*, for seed, for weeding and for collecting his crop. He has seldom money on hand for these purposes and has therefore to run to moneylenders and borrow it at any rate of interest. The formation of village banks exempting them from the Indian Companies Act when their capital does not exceed Rs. 25,000 is a remedy well worth trying. Another remedy is to make advances from Government treasuries at a settled rate per acre and recovering the amount at 9 per cent interest as land revenue. Post Office Cash Certificates can be popularised in villages and Government can collect a fund this way and utilise it on short-term loans as above. A still surer and better way is to encourage co-operative societies to do this work and to realise the amount so advanced as arrears of land revenue.

(6) Fixing the maximum rate of interest that can be demanded.

There is no provision at present in the law anywhere laying down the maximum rate of interest recoverable. It should be laid down by statute that interest at more than 36 per cent per annum shall not be recovered by a suit or by any other legal process. The Hindu Law rule of *damdopat* should be made applicable to all persons and in all cases.

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(7) Reckless cultivation of fields on leases.

This cause has come to the forefront for the last twenty years. With the spread of education, people begin to think that they should cultivate land of others rather than serve. Service is naturally regarded as derogatory and there is an unhealthy and reckless demand for land on leases. Crops do not always come up to expectation and much of latter day indebtedness is due to this reckless leasing of lands. Here again the remedy lies in education on right lines.

(ii) The source of credit are—

(1) The village moneylender who is willing to accommodate a cultivator at all times.

(2) The commission agent or *adtya* who finances a constituent against the security of crops.

(3) The village seed sellers.

(4) Co-operative societies.

The last is the best as it looks to the interests of the borrower more than to those of the lender.

(iii) The reasons preventing repayment are :—

(1) Bad seasons.

(2) Innate habits of unpunctuality.

(3) False notions of dignity preventing a man from finding out work after work in the fields is over.

(4) General rise in the standard of living without corresponding increase in the production of wealth ; in other words, habits of spendthriftness encouraged by tempting and showy ways of modern civilisation.

(*b*) I would advocate the enforcement of the law of *damdopat* by which a creditor is restricted to recover the amount of interest at any one time not exceeding the principal, and spread of the principles of thrift through co-operative societies. I should not advocate legislation in any other respect.

QUESTION 7—FRAGMENTATION OF HOLDINGS.—(*c*) I should advocate legislation in respect of widows having only a life-interest. I should like to have a provision made barring all suits filed after twelve years by reversioners claiming the estate after the widow's death ; and to keep disputes out of court. I would like Arbitration Societies as in the Punjab established everywhere. For persons who do not join such societies I should like to have judicial Village Panchayats established which will be empowered to settle money claims and lease money suits of the value of Rs. 250 or under.

QUESTION 10—FERTILISERS.—Towns produce a lot of natural manures and in almost every town this manure is wasted. I should have Agricultural Associations or Development Associations established to whom Municipal Committees and Sanitation Committees would sell their manures at a concession rate in order to enable these associations to bind this manure into shape, to make it easy of transport and to enable common cultivators to buy it for their use. In Berar, the practice of using cowdung as fuel is on the increase on account of the scarcity of wood fuel. I should encourage the establishment of fuel depôts. A regular and continuous propaganda dissuading people from using cowdung as fuel and preserving it for field manuring and also for preserving cattle urine for manurial purposes will certainly result in improving many fields.

QUESTION 11—CROPS.—(*a*) (iii). DISTRIBUTION OF SEEDS.—The Department of Agriculture should utilise the machinery of co-operative credit societies for distribution of seeds. At present the department is not in a position to meet the demand for seeds required. The department should organise seed stores on co-operative basis in as many places as possible. To encourage sale of good seed, the department should establish licensed sellers who will be selling good seed at fixed rates.

QUESTION 14—IMPLEMENTS.—(*b*) Machinery may be popularised if steps are taken by Government through the Agricultural Department to organise small parties in charge of a set of useful implements like a chaff-cutter, winnower and a tractor-plough, touring round in villages and undertaking work at rates cheaper than what it costs agriculturists to do similar work. Such parties should also undertake to sell implements and supply spare parts and also arrange periodic inspection to advise agriculturists on wear and tear and the replacement of parts.

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QUESTION 17—AGRICULTURAL INDUSTRIES.—(*a*) In the months of April and May, an agriculturist works in his field from 7-30 a.m. to 10-30 or 11 a.m., *i.e.*, for about four hours. In June, after sowing begins he works for 5 to 6 hours a day. From July to September he works for 5 to 6 hours a day. In October and November he works very little, say, about 2 hours. From December to the middle of February, he is busy in harvesting his crops and works for about 6 hours a day. The total number of hours he works in all according to my idea is 1,132 hours and taking 8 hours as a day a cultivator works for 179 or 180 days or six months. The real slack season for an agriculturist in Berar is from the middle of February to the end of April, *i.e.*, for 2½ months. In other months, he has not usually a full day's work. This calculation holds good for an average cultivator who cultivates from 16 acres to 25 acres of land.

(*b*) With a view to give training for necessary subsidiary industries and as a means for encouraging their adoption, I would advocate that in vernacular middle schools classes for the teaching of handicraft should be attached. As these schools are situated mostly in rural areas, it will create a bias for such industries in the early part of the life of a cultivator and he will in after-life easily take to the art that he has learnt, as a means of additional income. The industries that strike one as easy of adoption in Berar are—

(1) Rope-making; (2) basket-weaving; (3) tailoring; (4) the industry of wheel-wrights; (5) spinning and weaving; (6) dairy-farming; (7) fruit and vegetable growing; (8) tape-weaving and lace-making, and (9) carpet and blanket-weaving.

Suitable implements for these industries should be made readily available. If the technical institutes and schools for handicrafts in the Province were asked to manufacture some selected implements, a supply could be assured at a reasonable cost. Government aid should be granted where necessary for purchasing these implements.

(*d*) and (*e*) In these days of oil-engines, it should not be difficult for industrial concerns to move to rural areas; and certain amount of employment would undoubtedly be available to cultivators from January to June, when their work in fields is easy. If a set of a few gins worked with an oil-engine could be established in a village of a moderate size, not only would a cultivator get employment but the labour of moving unginned cotton from village to town and cotton seed from town to country would be saved. The cultivator would, in addition, be able to earn a portion of the profit which the middleman earns by purchasing raw cotton, ginning it and selling the same as ginned cotton in *bojas* to big cotton buyers.

QUESTION 22—CO-OPERATION.—Co-operation applied to agriculture aims at supplying capital at a cheap rate and also making the farmer a businessman in the sense that he realises that he has a definite place in the production and distribution of wealth. By constant practice of the virtues of self-reliance, thrift and mutual help it teaches him to elevate himself to a higher level and learn the art of living in frugal comfort. This involves the abandonment of age-long habits. The change is so great that it may be described to be a complete metamorphosis. In view of the apathy and ignorance prevailing among cultivators, this would require the efforts of a whole host of able men available in the country. An intensive and continuous propaganda is a *sine qua non*. The following steps are necessary :—

(*a*) (i) Steps to be taken by Government —

(1) Government in the Central Provinces and Berar does not spend as much amount on co-operation as other Provincial Governments in India do. This Province is educationally backward. A larger expenditure is really justifiable but Government should at any rate be prepared to spend as much as Governments do in other Provinces.

(2) The development of the movement requires the services of a whole-time competent officer of Government and the Registrar of Co-operative Societies should not have other work saddled on him. He should not be changed frequently as the incumbent of the office does not feel any real interest in his work. It is further necessary that he should be an Indian, as he is able to talk to people in their own language, mix with them and appreciate their difficulties and inspire confidence by his advice and guidance.

(3) Conditions in Berar differ so materially from those in the Central Provinces and problems in Berar are sometimes so peculiar that it is desirable that there should be a separate Assistant Registrar in charge of Berar. Berar offers a good field for the development of co-operation and it would be well if an officer of the grade of an Extra-Assistant Commissioner is given to him. This Assistant will be in charge of the routine duties and the Assistant Registrar would be able to devote himself to the spread of the movement on right lines.

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(4) It is very desirable that the Registrar and his Assistants should have an acquaintance with the working of the co-operative movement in foreign countries and it would repay Government to grant study leave to these officers. They should also have an intimate knowledge of the movement in the different Provinces in India and should be permitted to lead deputations of non-officials to sister Provinces so that they may profit by the example set up there. Two such deputations in the past have given a distinct impetus to the movement in the Province.

(5) Even in the subordinate ranks of the service it is necessary to insist on co-operative training. Government should be prepared to bear the expenditure of having men in the service trained in the principles and practice of co-operation and should also be prepared to maintain a class for persons wishing to enter the department to get qualified for the work. It is equally necessary that there should be refresher courses for permanent servants. Men who are better qualified and better trained can alone cultivate the missionary spirit that is necessary for spreading the gospel of co-operation amongst farmers who are proverbially slow to take to new ideas and methods.

(6) Sympathy and help of the officers of the Department of Agriculture and the Department of Revenue would be very useful. If the village agency of the *Patels* and *Patwaris* is allowed to be at the disposal of the Registrar of Co-operative Societies, an impetus would be given to the movement without much extra cost. Officers of the Revenue and Agricultural Departments are constantly on tour and if in their visits to villages they make a point of seeing village societies and giving them sympathetic advice their visit will not be felt as an "official interference" and a lot of good will be done to the movement.

(7) Government should encourage non-official agencies like Institutes in their efforts about education and propaganda by suitable grants-in-aid. No grants to Institutes are made in this Province whereas in sister Provinces large grants are made.

(8) Co-operation is now a Transferred subject and further progress in the movement is dependent on the vote of the Council. It is therefore very desirable for the minister to be fortified by the advice of experts, both official and non-official. A Board of Co-operation should therefore be established to consider questions arising from time to time and to advise the Minister. It should consist of:—

Minister for co-operation as Chairman and Registrar of Co-operative Societies as Secretary and the following as members:—The Director of Agriculture, a representative of every Co-operative Institute, a representative of the Central Provinces Federation, a representative of the Provincial Bank, a representative of the Central Banks in Berar and a representative of all Central Banks in the Central Provinces.

The Board should meet once every quarter. The Board would not cost Government more than Rs. 3,000 a year.

(9) Government should materially assist the financing of land mortgage banks as the co-operative movement to-day does not reach the upper class of landholders who are equally in need of capital.

(10) In granting *taccavi* loans to persons who are members of co-operative societies, Government should employ the agency of Co-operative Central Banks and societies.

(11) In suitable places and in consultation with the Registrar, Government should try the experiment of encouraging a village society to carry on savings bank business in that locality.

(12) The Maclagan Committee on Co-operation in their Report in 1915 in paragraphs 218 and 219 point out the necessity of Government taking steps to provide facilities for re-discount to co-operative banks and thereby give to their finance that elasticity without which present stability and the safe progressive development of the co-operative movement appear to be difficult. It is noticeable this year, for instance, that while there is plethora of money with the Imperial Bank, agriculturists find it difficult to get money at reasonable rate of interest. It is for Government to see that money is made available for agriculture when it is not wanted for commerce and this can be accomplished by enabling the Imperial Banks to place their money at the disposal of co-operative societies or by starting an All-India Co-operative State Apex Bank through which re-discount of co-operative paper can be arranged. An attempt made in this Province in this direction failed because it demanded too large a price from the Central Bank and societies.

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(13) It is very necessary for the Government to see that the study of rural economics is carried on by the University and the results of study are taught to all boys and girls in primary and secondary schools. Lessons on co-operation in schools and colleges would leave an impression on young minds which will be of everlasting benefit to them in after-life.

(14) It is desirable that Central Banks should be given the power of recommending suspensions and remissions of land revenue on the lines laid down by Government. Central Banks and financing agencies get a correct idea of the extent of the crop and there is no reason why they should be ignored in the important work of granting suspension and remission.

(15) It will pay Government to occasionally grant scholarships to students to go abroad to study the benefits of co-operation and come back and bring about necessary reforms in the movement.

(16) Development Associations for taluks should be formed and they should work under the guidance of the District Officers who should stand as well-wishers, equipped with requisite knowledge and sympathy to co-ordinate the activities of the Departments of Agriculture and Co-operation, and help the cultivators to advance materially in all directions. Such associations are doing good work in Bombay.

(*a*) (ii) Steps to be taken by non-official agencies :—

(1) The non-official agencies in existence to-day are the Central Banks, the Institutes, the Central Provinces Federation and the Provincial Banks. Central Banks in places where Institutes do not exist are expected to carry on propaganda. Even the Berar Co-operative Institute works through the Central Banks. The activities of these bodies are limited by funds which at present are very meagre and unless they are substantially assisted by Government their work is bound to be small. To increase the outturn of work it is desirable that Central Banks should have sub-committees, and that the Institute's local branches should be specially in charge of education and propaganda. The attention of Central Banks is naturally taken up with questions of finance and unless a special agency is created for education it is bound to be neglected. This is the reason why primary societies in the Central Provinces and Berar are found to be weak. If committees of education and local branches are formed, it would be easy to attract new men who feel interested in the work.

(2) Central Banks as financial bodies have to be maintained in a state of efficiency and it is advisable that these bodies should have a common cadre of servants. These may be worked through the institutes or special joint committees.

(3) Membership of institutes is at present voluntary with the result that great difficulty is experienced in inducing societies and banks in joining them. The Berar Co-operative Institute finds it difficult to differentiate between paying and non-paying societies and works equally for all. It would be well in such cases if the Registrar charged suitable fees to these societies for their education and propaganda and remitted it to the institutes as money earmarked for a special purpose.

(4) Central Banks should be intensive rather than extensive in their efforts. It would be well for Central Banks to concentrate their attention on a few societies and make them model ones for other societies to follow. This line of work would yield better results as example is always better than precept.

(5) No efforts are at present made to induce members of credit societies to form associations for reducing ceremonial expenditure or to abandon expensive social customs. Such an attempt is very desirable and necessary.

(6) Central Banks celebrate their annual meetings and while efforts are thus made to acquaint members of primary societies with the affairs of the central financing agency, practically nothing is done in village societies. If these latter are taught to hold meetings and take an annual stock of the pecuniary condition of the society as a whole and the economic betterment of every individual they would soon learn to imbibe the lesson of thrift and self-reliance. If Central Banks are regarded as money-lending concerns now, they are deemed to be so, because in actual practice very little is done to see to the application of money and to assure that it is utilised for productive purposes.

(*b*) The following observations are offered on the types of societies mentioned below :—

(*i*) *Credit Societies.*—(1) In Berar, primary societies are of the Raiffeisen type where liability is unlimited and membership is restricted to the village. On the whole

this type is working well but societies should be allowed to have greater freedom to incur expenditure on necessary objects. The present practice of crediting the entire profits of the society towards the reserve fund is intended to build up a large reserve and though it is commendable from that point of view it leaves no incentive to members even to meet and consider subjects of common advantage. With the sanction of the Registrar these societies should be permitted to spend up to one-fifth of their annual profit for necessary objects, *e. g.* the expenses of an office or the honorarium to an account writer etc.

(2) The average rate at which members get loans from the society is 12 per cent per annum. This is dictated by the fact that Central Banks get deposits at 6 to 6½ per cent. They calculate their working expenditure at 3 or 2½ per cent and are prepared to give loans to village societies at 9 per cent. The margin of profit of village societies is fixed at 3 per cent and individual members get loans at 12 per cent. Central Banks calculate their working expenditure at 3 or 2½ per cent as stated above as they are asked to have a large cover for their deposits. The present practice is to demand 33 per cent in case of fixed deposits, 50 per cent in case of savings bank deposits and 100 per cent in case of current deposits.

These limits are too much on the side of caution. These percentages can be reduced to 25, 33 and 50 without serious risk.

(3) To prevent over-financing, the Registrar or the Board should issue land values statement at least once every year to serve as a guide to banks and societies for advancing loans.

(4) It is necessary to amend the Berar Land Revenue Code in such a way as to make sums due by members of co-operative societies under award recoverable as arrears of land revenue.

(5) In the Central Provinces, it is necessary to make tenants' holdings transferable to a society.

(6) In the Central Provinces and Berar, but more in the Central Provinces, it is necessary to amend the Insolvency Law in such a way as to make the dues of a society recoverable as a second charge after Government revenue which is declared to be a first charge.

(7) The Raiffeisen type of credit societies touches only the lower strata of small agriculturists. In order to attract bigger people to the benefit of co-operation it is necessary to start land mortgage banks. There is good scope for these in Berar.

(8) Much of the time of the Registrar and his assistants is at present taken up by cases of awards against members of societies. This time can be saved by appointing arbitrators. Superior agency will thus be free to direct the movement along right lines.

(9) In spite of understanding that members of societies are not to borrow from outsiders it often happens that members borrow from others. This is partly due to the inability of Central Banks to finance members for all their needs and partly due to recklessness. Societies and Central Banks are sometimes exposed to serious risks by members borrowing from outsiders or even mortgaging or selling their property. To safeguard against risks and to prevent over financing, it is desirable that Sub-Registrars should be asked to send a copy of the list of transactions registered concerning sale, mortgage, gift or lease of properties in a village in which a co-operative society is situated to the Central Banks concerned at the end of a month. Sub-Registrars are required to send such copies to village officers for purposes of record-of-rights and sending a copy of it to Central Bank would not put them to any extra trouble. Central Banks will, on receipt of such lists, keep the society informed and both the bank and the society will be on their guard so far as future financing is concerned.

(10) The Maclagan Committee have pointed out the difficulty which Apex Banks experience in providing adequate fluid resources and they have also pointed out the necessity of Government giving assistance in times of financial stress and it is time for Government to accept the recommendations and supply fluid resources or give financial help when necessary.

(11) It is desirable that Central Banks should exert to teach members of societies the advantages of the use of paper in place of cash in their transactions. They should be familiarised with the use of cheques, etc. This will have the double effect of saving the necessity of using metal every time and will also tend to prevent members from suffering their savings to lie idle or buried.

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(12) Repayments begin to flow into Central Banks from the middle of October to the end of March and in these months they hold large amounts of cash balances which they cannot utilise. It would be better therefore if they are encouraged to supply cash to big and solvent firms like Ralli Brothers and others to buy cotton against their cash credit with the Imperial Bank. Co-operative money would thus facilitate cotton trade in a small way and may at the same time derive advantage to the movement.

(iii) Societies for the sale of produce.

The form that this type of societies has taken in Berar is the cotton sale societies through which members of societies and their friends and relatives sell cotton to pur chasers in cotton markets. They save commission charges to a certain extent as they get back what they pay in the beginning in the shape of profits of the shop. They save themselves from the malpractices of an ordinary commission agent. So great is the force of habit that in spite of clear advantages farmers do not readily take to sell their goods through co-operative shops and these societies languish for want of a propaganda all the year round amongst the members of societies. In addition to propaganda the following steps are necessary if these shops are to stand in the competition with existing *adtyas* or commission agents.

(1) Rules for the management of cotton markets should lay down that the *adtya* should maintain a register showing the rate they have secured for each cart sold to the buyer. Recent examination of books of *adtyas* by an officer of Government in Amraoti showed that *adtyas* receive larger sums from buyers than they pay to the sellers. A copy of this register should be required to be sent periodically to the Cotton Market Committee.

(2) Cotton Market Committees should be compelled to insist on weighing of cotton being done by platform scales, instead of beam-scale. If necessary, cotton markets should maintain platform scales in the principal ginning factories.

(3) Statistics of lint percentages must be maintained by these shops, so that they can judge whether proper prices have been quoted for their goods.

(4) Facilities should be provided in these shops for advances of cash against goods up to a settled maximum, so as to prevent a needy farmer suffering by having to sell in a falling market.

(5) These shops must further be able to provide facilities for having cotton ginned before it is sold as sometimes the prices offered for ginned cotton are proportionately greater than for unginned cotton.

(6) These shops should insist on farmers not mixing up superior and inferior quality of cotton as far as possible. These shops will enhance their prestige in the markets if they induce their constituents to stick to uniform quality of cotton at every sale.

(vi) Societies for the co-operative use of machinery.

There is a large scope of such societies in Berar. Activities are at present confined to selling machinery and hiring out of ploughs. Labour is comparatively dear in this Division and labour-saving appliances are therefore welcome. If the Departments of Agriculture and Co-operation combine and work through Taluka Development Associations, even tractors and other costly machinery can be bought and given out on hire. The essentials of success here are—

(1) A ready supply of spare parts and fittings.
(2) Inspection and advice regarding replacement of the wear and tear.
(3) Willingness of central financing agencies to help such societies with funds on reasonable rates of interest.

(vii) Societies for joint farming.

With an average holding of 18 to 20 acres such societies are necessary but the chief drawback is the want of mutual confidence necessary for such a venture. These societies should succeed in Berar. An experiment should be tried. Government should be induced to guarantee the capital necessary for joint farming by way of a loan at 6 per cent on the security of the land. There is no reason why a well selected co-operative society should not yield satisfactory results and once an experiment succeeds it is sure to catch on.

(ix) Other types of societies.

Thrift Societies. Societies to reduce ceremonial expenditure and arbitration societies to decide disputes are well worth trying in Berar. There is no reason why they should not succeed here as they have done in the Punjab.

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(*d*) Credit societies have served their object in finding money at cheaper rates. In villages where there are co-operative societies village moneylenders do not quote a rate of interest higher than the one quoted by the society to its members. But while one is prepared to say this and to maintain that commensurate with the efforts made, the Department of Co-operation has achieved success, it is very necessary to bear in mind that greater efforts are necessary to ensure that agriculturists imbibe the real co-operative spirit and the justification of a larger expenditure and greater efforts lies in the fact that if we succeed in improving the lot of farmers we shall be securing national prosperity and happiness, as the Central Provinces and Berar is a country of small farmers.

QUESTION 23—GENERAL EDUCATION—(*a*). Education in its present state is designed to be merely literary. At no stage does it aim at being industrial in the largest sense of the term. Boys coming out of the University schools naturally hanker after service and when it is not available, they become discontented and begin to rot in life. Parents of children in rural areas loudly complain that education in primary schools unfits their children for work in fields.

(*b*) (i) The remedy lies in establishing schools where the boys are given distinct agricultural education while they are learning in schools and are taught industries which should be useful to them while they are cultivating their lands.

(ii) Compulsory education in rural areas is in its infancy in Berar and cannot be said to have taken root. The reasons are .—

(1) Government is overcautious in introducing real compulsion.

(2) Local bodies are unwilling to enforce the provisions of law to compel attendance.

(3) The people naturally feel that without getting a substantial advantage, they are called upon to spare their children for schooling when they can be utilised for adding to the family income.

(iii) Generally speaking, boys in villages enter school at the age of seven and they begin to be useful to their parents at the age of ten in tending cattle etc. As higher education does not afford them greater prospects, there is no incentive to parents to continue their boys till they complete the course of primary training by passing the fourth class.

QUESTION 25—WELFARE OF RURAL POPULATION.—(*a*) Village life should be made more attractive by better roads, by better sanitary conditions and by greater amusements. This would give a stimulus for men of capital and education to stick to villages which are at present abandoned in favour of towns. Schemes for rural reconstruction should be thought of and put in force by suitable grants and facilities.

(*b*) Economic surveys in typical villages are a necessity and no time should be lost in undertaking them as they will act as correctives in many directions and will also indicate the correct line of action to be followed for improving conditions obtaining in rural areas. Study of rural economics would be fostered and when it becomes intensive all persons concerned will begin to think of the ways and means of improving the lot of cultivators.

Oral Evidence.

29906. *The Chairman*: Rao Bahadur Brahma, you are President of the Berar Co-operative Institute, Ltd?—Yes.

29907. You have been Director of the Amraoti Co-operative Central Bank from 1912 and also President of the Berar Co-operative Institute since 1923?—Yes.

29908. You have been Vice-Chairman of the District Board, Amraoti, from 1916 to 1924?—Yes.

29909. You have handed in for the Commission a note of the evidence that you wish to give. Is there anything that you would like to say at this stage apart from that which you have already written in this note?—There is nothing in particular.

29910. I should like to ask you one or two questions on your note. Is the quality of the teacher a great difficulty, in your view, in attaining the ideals of rural education?—There is some difficulty.

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29911. What are you paying your teachers?—They start from Rs. 15 and rise to Rs. 60 in the primary schools.

29912. Do you think that salary is likely to attract the right type of man?—Not the bottom grades; the top grades might.

29913. Have you familiarised yourself at all with the system for instructing teachers?—To some extent.

29914. Are you satisfied with those?—Except in the matter of this particular agricultural bias that I want the teachers to have, I think the method in normal schools for instructing teachers is pretty good.

29915. Conducting nature study is not a very easy thing for a man to do, is it?—No he must have a real grasp of the matter himself.

29916. And he must also know how to present that matter to young children?—Yes, and after that the man must have facilities to impart education in the school. Nature study should not be done in the school-room as it is done at present in many schools. It should really be done outside in the open.

29917. Have you any experience of adult education?—Not much.

29918. So that you are speaking here in very general terms?—Yes.

29919. Have there been any experiments in the districts with which you are familiar?—Not in the district from which I have come, but I have seen experiments carried on at Nagpur.

29920. Would you describe them very shortly?—A man named Mr. Mandey who has received his training in America, has developed a system of adult education and I have seen his experiments for a long time. He gave a demonstration to us at Amraoti in which he was able to make three men from the street catch the letters and to read within one hour. His is a special system; he tries to attract the mind of adults on particular letters. For instance the Marathi word for grass is put down in the vernacular and he shows a bundle of grass in a picture and asks the adult to remember the bundle, and he then carries the mind of that man through several lines in which this word is repeated and in that way he asks the man to remember that the first word is *gha* and the second word *sa* and so on, and that is how the man is able to pick it up.

29921. Well, that was an experiment in method. Now what happened in practice? Were the public anxious to avail themselves of this opportunity?—Yes, they would be.

29922. Were they in fact given an opportunity in this particular case of undergoing a course?—No.

29923. That was really a demonstration of method?—Yes; they tried that experiment in the Civil Jail here at Nagpur and the Home Member of the Central Provinces Government has given a very good certificate about its success.

29924. Now, in answer to Question 5 in the Questionnaire on Finance, you say that for long-term loans, land mortgage banks should be started? One of the difficulties in this Province is the fact that so many cultivators are on occupancy holdings and have therefore nothing to mortgage?—That is the case in the Central Provinces, but I am speaking of Berar only.

29925. Are there not occupancy holdings in Berar?—No, all ryotwari holdings.

29926. All the cultivators in Berar have something to mortgage?—Yes.

29927. And you suggest that the Indian Trust Act should be so altered as to include that type of security? Then you suggest that the Imperial Bank Act should be amended to permit that bank to put money in these debentures? Do you happen to know whether there is any enthusiasm for this proposal in the minds of the Directors of that bank?—Yes.

29928. Do you think they are eager to invest their funds in loans on mortgage?—Yes.

29929. How do you know that this is the case?—In fact our Institute and some banks in Berar have actually made proposals to Government and have put forward a scheme; they are only waiting for Government to give the necessary facilities to the Imperial Bank to have the power to float our debentures and get this money.

29930. Does the Imperial Bank at the moment lend money to co-operative banks?—It was told to, but there was some difficulty about that. The Imperial Bank tells us that they have this difficulty that they cannot lend money on the security of co-operative paper or even on the security of land mortgages That was the difficulty which the Governors of the banks who attended the Registrars' Conference at Bombay brought to our notice.

29931. Is it within your knowledge that there is now before the Assembly a proposal to amend the Act in the direction which you suggest?—I have simply heard of it.

29932. On page 243 in your answer to Question 6, Agricultural Indebtedness, you suggest the formation of village banks and the exempting of these banks from the Indian Companies Act when their capital does not exceed Rs. 25,000? What exactly had you in mind when you made that suggestion? What functions do you suggest that these banks should carry out?—Outside the co-operative societies, agriculturists do not get money on easy terms. The rate that is charged in Berar and part of the Bombay Presidency is usually 2 per cent. My idea is that if they can collect the capital which the local people will be able to subscribe, and form a company like a bank, they will be able to lend money to agriculturists who are not members of the co-operative societies at a much cheaper rate.

29933. Your suggestion is that the capital of these village banks should be derived from public subscription in the village: is that the idea?—Yes, or from round about the village.

29934. But you are going outside the ordinary Companies Act? You are going to suggest exempting them from the various obligations and restrictions imposed by that Act?—Yes.

29935. What particular advantage are you seeking to give them by that exemption?—These people living in rural areas are frightened by the provisions of the Companies Act, for instance, the liability to submit returns on due dates, they think this is too much for them to agree to and to actually carry out in practice.

29936. Do you not think that the Co-operative Acts were designed to meet those difficulties?—Yes, but the difficulty in co-operative banks is this that we do not finance individuals. We advance money to societies and the societies are supposed to advance to individuals.

29937. Is there any reason why the cultivators should not deposit savings in the local societies?—We are trying to induce them to do so. I suppose rural people will be able to get money more quickly and more cheaply by this experiment.

29938. Do you not think there is any danger of slack management?—I do not think so.

29939. There is one point I would like you to clear up. On page 244, in your answer to the same question, you mention the Hindu law of *damdopat*, by which a creditor is not allowed to recover more as interest than the amount of the principal, and on page 243 you say that this should be made applicable to all persons and in all cases. At the moment that law applies when both parties are Hindus?—No, when the debtor is a Hindu. It is only in the Bombay Presidency and Berar that this rule of *damdopat* applies.

29940. You suggest this selective quality should be removed altogether?—Yes.

29941. You talk about the law. What is the position exactly? Is it a law?—We call it a law because it is part of the Hindu Law which is a personal law based on custom.

29942. And the courts pay attention to it?—Yes, as a matter of personal law if is recognised.

9943. Assuming it was generally agreed that it would be well to remove the inequalities at present existing, how would you give effect to that proposal?—If an Act were passed in the Legislative Assembly restricting the power of the individual to enforce a particular rate of interest then the creditor, when he wants to recover his money, will be forced to go to the court within a stipulated time. The creditor according to the rule of *damdopat*, must do so within a certain time.

29944. So you suggest the passing of a general Act to make the conditions of *damdopat* generally applicable?—Yes.

29945. Your answer to section 7 of Question 6, where you talk about the reckless cultivation of fields on leases appears to me to contain three separate ideas, which are associated in your one answer. There is the question of the reckless cultivation of fields, and there is the question of the desire to cultivate the lands of others rather than to do service, I suppose, as labourers: Is that the idea?—Yes.

29946. Then you refer to the fact that crops do not always come up to expectations, and much of latter-day indebtedness is due to this reckless leasing of lands?—The situation in Berar is this. From 1918 to 1924 cotton was selling at the enormous price of from Rs. 100 to Rs. 150 per *khandi*. Naturally all the people thought that agricultural leases would be influenced by these prices and ordinary cultivators who wanted to take land on lease used to offer more lease money on the expectation that the high price of cotton would continue, but on account of the general settlement of the world, and for other reasons, cotton prices have gone down, and the rainfall has not been satisfactory and crops have failed. What with that and with the rates going down, they find they are not able to pay their rents.

29947. Perhaps a better heading would have been 'reckless leasing for the purpose of cultivation'?—Yes. I think so.

29948. To go back to my question of a minute or two ago as to the Imperial Bank Act and the limitation imposed on the bank in the matter of lending to co-operative societies, is it within your knowledge that the Imperial Bank is at present giving cash credits to the Provincial Co-operative Bank in Bombay and also to District Central Banks in Madras?—Yes, I know that the Amraoti Central Bank has got a cash credit to the extent of 2 lakhs of rupees, but that is more on the security of Government paper that these banks hold.

29949. You are talking about subsidiary industries in answer to Question 17, section (*b*), and you suggest various spare-time occupations such as rope-making, basket-weaving, tailoring and so on. Do you think there is any caste prejudice against some of these spare-time occupations?—Not against those I have mentioned.

29950. You do not think there is any prejudice against rope-making?—None. As a matter of fact some better-class people, who have an idea of making money during their spare-time, do this work even to-day.

29951. Chicken farming is in a rather different position?—Yes. That would not be liked by Hindus.

29952. How many Co-operative Institutes are there at the moment?—There are at present two Divisional Institutes, one for Berar and another for the northern districts. There is also a common institute which is called the Central Provinces and Berar Federation. That serves the Central Provinces proper and Berar.

29953. The Board that you suggest should be set up to advise the Minister should consist of the Registrar of Co-operative Societies, the Director of Agriculture and two representatives, one from each Co-operative Institute, a representative of the Central Provinces Federation, a representative of the Provincial Bank, a representative of the Central Banks in Berar and a representative of all Central Banks in the Central Provinces. Do you think that would be a feasible proposal? Do you see any difficulty in these several persons meeting and getting together?—I do not think so. In fact, a Co-operative Committee of this type was attempted while the Hon'ble Sir S. M. Chitnavis was the Minister in charge of this department.

29954. On page 247 in your answer to the same Question 22 (*a*) (i), you say that it is desirable that Central Banks should be given the power of recommending suspensions and remissions of land revenue on the lines laid down by Government Do you think it is a wise thing to give to bodies who have no responsibility for the

collection of revenue the right of recommending remission?—The point in my mind was that these co-operative banks come in contact with the people in villages every day, and thus they get a more correct idea of the real state of the people; and they are not influenced by the same executive opinions as the Revenue authorities.

29955. On the other hand, they are not stimulated by the same financial demands, are they?—One might say that, of course.

29956. On page 247 in your answer to Question 22 (*a*) (ii), you say that the Berar Co-operative Institute finds it difficult to differentiate between paying and non-paying societies and works equally for all. What do you mean by that?—The situation is this. We expected every village society would voluntarily affiliate itself to the Institute, but we find in actual practice that out of 700 societies in Berar only 300 have enrolled and 400 are standing out. They think they do not stand to gain much, because the ordinary villager looks to an immediate gain rather than a distant profit. As, however, the Institute wants to spread education and propaganda, it works for all societies, whether they are affiliated or not.

29957. You mean between the affiliated and non-affiliated; that is the point?—Yes.

29958. Then you make the very sound suggestion that the primary societies should hold meetings and say that if they can be taught to hold meetings and you take an annual stock of the pecuniary condition of the society as a whole and the economic betterment of every individual they would soon learn to imbibe the lesson of thrift and self-reliance. How many of the primary societies with which you are familiar do in fact hold annual meetings?—At present very few hold annual meetings of the type I have in mind. The whole idea is that we must get them to hold annual meetings for the purposes of examining the condition of each individual member.

29959. So they run from one year's end to the next without any meetings at all?—Without general meetings. There are meetings of village societies when they have to apply for a loan, and they pass resolutions that they are prepared to advise the Central Bank to give a loan.

29960. Has that to be approved by a general meeting?—Not necessarily.

29961. Do you know any societies that have never had a general meeting?—No. Every society has a general meeting once a year, but not of the kind I am suggesting.

29962. It has one meeting a year?—Yes, to pass its accounts.

29963. Are they well attended as a general rule?—I think they are fairly well attended.

29964. *Mr. Calvert*: What do you mean by "fairly"?—I mean about 60 per cent of the members.

29965. *The Chairman*: On page 248, in your answer to Question 22 (*b*) (i), you say it is necessary to amend the Berar Land Revenue Code in such a way as to make sums due by members of co-operative societies under award recoverable as arrears of land revenue, and then over the page in paragraph (6) you say that in the Central Provinces and Berar, but more in the Central Provinces, it is necessary to amend the Insolvency Law in such a way as to make the dues of a society recoverable as a second charge after Government revenue, which is declared to be a first charge. Is there any material difference between the two proposals?—There is. The first is to amend the Berar Land Revenue Code, which is a provincial measure. The other is to amend the Insolvency Law, which is an All-India measure. This question was brought up in the All-India Registrars' Conference and was negatived, but the feeling is very strong indeed in the Central Provinces that the Insolvency Law ought to be amended. The Central Provinces and United Provinces members actually moved a resolution about it in the All-India Registrars' Conference, but the conference did not give its weight to that opinion, and the proposal was vetoed.

I see that your first proposal applies only to the Berar Land Revenue Code.

29966. Would you explain what exactly you mean by your answer to our Question 22 (*b*) (*i*), on page 249, paragraph (12)?—The proposal is to authorise Central Banks to use their money for purposes of financing purchase of cotton by big firms. In Berar what happens is that a firm like Ralli Bros. or the Japanese firms have got

their outlying agencies in small towns, where there are no branches of the Imperial Bank to give over cash on the day that it is required. For instance, at a place called Telhara, 28 miles away from Akola, there is no branch of the Imperial Bank. Money is required to be paid to the cultivators when these agents buy cotton. These agents have money in the shape of a draft on the Imperial Bank at Akola; but somebody is wanted to supply cash in way-side places. The Central Bank at Akola will be able to utilise its money for a short time for the purpose, and there is no danger because the money is covered by the draft on the Imperial Bank.

29967. Do you find that these Central Banks hold a good deal of cash?—In those months they do.

29968. Why do you prefer platform scales to beam scales?—Many of the frauds that we hear of are due to the use of beam scales. The beam scale has got two pans, one for the load and the other for the weight; the carts have to be weighed by several loads and when a quantity is weighed it is dumped in a heap of cotton. The weigher on behalf of the buyer or agent of the particular cotton grower goes on calling weight after weight in vernacular numbers, and very often the complaint is that they take jumps, that is to say from 21 they jump at once to 30 and so on. If a platform scale is used, there is no necessity of counting, because the whole of the cart can be weighed at once.

29969. Do you mean to say that they are a little optimistic in their addition? Is that it?—Yes.

29970 I suppose the platform scale is much harder to tamper with than a beam scale?—Yes, that is also true. My suggestion is that the cotton market committees should have control of these platform scales, because it is just possible that gains by dishonesty may induce people to tamper with the springs below; if the cotton market committee has control over it, there would be very little chance of that being done.

29971. In dealing with these selling societies, you say: "Facilities should be provided in these shops for advances of cash against goods up to a settled maximum, so as to prevent a needy farmer suffering by having to sell in a falling market". Is it your suggestion there that the farmer should hold in his house or that the society should hold in its godown?—The society should hold in its godown.

29972. At present they have got no storage at all?—No.

29973. They would have to pay for it?—Yes.

29974. You suggest that these shops must further be able to provide facilities for having cotton ginned before it is sold, as sometimes the prices offered for ginned cotton are proportionately greater than for unginned cotton?—Yes; that is what has been found to be profitable in the Bombay Presidency.

29975. Would not the cost of providing storage and a ginning plant mean a considerable increase in the capital requirements?—It would afford the agriculturist at least Rs. 10 more per cart.

29976. But, as far as their capital requirements go, it would seriously increase them? They would be required to pay both the godown charge and the ginning charge?—The godown charge would be extra, but the ginning charge would be *nil* because the ordinary purchaser has got to gin it.

29977. They would have to build storage accommodation and also to build a factory and set up a ginning machine?—It is possible, in Berar, to get factories on the leasehold system; many are working like that. You get a factory for a season by paying so many rupees. It is not necessary for a co-operative society or a shop to build a factory for itself in the early years of its extistence.

29978. What do you think of the proposal that the society should act as merchant should buy the cultivator's crop, should make the best of the marketing that they can and should then divide the profits according to the amount of cotton which each cultivator has handed in?—The trade in cotton is very risky; it depends on the Bombay rate, which is influenced by Lancashire.

29979. Let us see where your own suggestion leads you. You are going to have a large godown?—A fairly large one.

29980. And your members' cotton is going to be, some of it at the back, some near the entrance, some of it underneath the heap; who is going to decide which member's cotton is going to be sold?—The system that I have seen working in the southern part of the Bombay Presidency is that when the cotton arrives and the market is dull, the society decides upon its quality and its value according to the prices prevailing on that day. Then a ticket is issued to the man to say that he holds so much cotton of such and such a quality. The cotton is stored in different heaps of different quality and sold in heaps of different qualities. The cotton is thus graded and when it is sold the man gets the benefit of it. In this operation of grading, an officer of the Agricultural Department assists.

29981. So that the man is really paid by an arrangement which gives him the equivalent of the value of his own cotton on the day that the sale is supposed to be effected, but in fact it is not his own cotton that is sold on that day?—Cotton of the same grade is lumped together and sold; he gets the advantage of a rising market, he need not rush his bargain through.

29982. Is much misunderstanding and bitterness apparent when, owing to some unexpected fall in the market, the cultivator does not get as good a price as he expected?—There is grumbling, naturally. They say that they have to pay the land revenue or meet the pressing demands of a *sowcar* or moneylender, and they have to sell at a disadvantage.

29983. Are these societies carrying on grading at the moment?—They are not.

29984. You suggest they should?—Yes.

29985. What do you say about the management of the Central Banks; in your experience, are you satisfied with it?—I am.

29986. You think it is good?—Yes.

29987. Who represents the cultivators on the bank?—The cultivators are all shareholders in the bank, and in the annual meeting they have got a direct vote on the working body or the managing committee. They elect the directors, and the Chairman is elected by the whole body. All the members of co-operative primary societies are shareholders, and each one of them has got a vote. They assemble in large numbers at the time of the meeting.

29988. The Commission has been given to understand that the individual applicants for loans, members of co-operative primary societies, have their applications examined not by their own primary society but by the Central Banks. What information is before the directorate of the Central Bank in examining particular applications?—In Berar the application is not examined by the Central Bank at all; it is merely scrutinised by them afterwards. The proposal is initiated by the society itself as a whole.

29989. So that, in Berar, primary societies show much more vigour than is the case with many societies in the Central Provinces?—Yes. In fact it is our endeavour to see that they do it to perfection.

29990. Are you satisfied with the way in which they carry it out?—I am not absolutely satisfied, but I am not pessimistic on that point; they are doing fairly well

29991. Are they improving?—They are improving.

29992. Have you any suggestions to make, other than those set down in your note, for improving the machinery of the co-operative movement either in Berar or the Central Provinces?—No; I have tried to go into details in my note.

29993. Are you satisfied with the rate of interest which cultivators pay in obtaining their loans?—Considering the market rate of interest, I think, there is every reason to be satisfied.

29994. Do you think there might be any danger in fact in offering extremely cheap credit to the cultivators?—Cheap credit without proper supervision is of course dangerous; the whole structure of the co-operative movement is to see that that supervision is applied directly when the loan is asked for.

29995. Do you think that more agricultural propaganda and demonstration might be carried out through the agency of the co-operative societies?—I do.

29996. Do you think that the crop organisations would be willing to undertake that work?—They would be, and I hope the Agricultural Department will co-operate; I have no reason to think that the Agricultural Department is unwilling to co-operate.

29997. Do you think that the co-operative movement might well join the attempt to consolidate unduly fragmented holdings?—Yes.

29998. That is a work which you would like to see the co-operative movement undertake?—That question does not arise in Berar.

29999. Are you familiar with the conditions in the Central Provinces?—Not much.

30000. Do you look forward to the day when spare-time occupations may be organised on a co-operative basis?—I do.

30001. How about the educative function of co-operation in Berar? Are you making any sustained attempt to educate individual members of primary societies in the principles of co-operation?—We have been doing it intensively for the past year.

30002. Is it showing good results?—Yes.

30003. Do you like the principle that the Central Banks should be, as it were, the overseers of the whole movement? Are you in favour of that principle?—For the time being I see no objection to it; if a better agency could be thought of, it would certainly be desirable. That is why we are starting institutes which have not got the financial side of the movement to look to.

30004. Do you think there are many cases in which individual members of credit societies borrow ostensibly for productive purposes, but in fact apply the loan to non-productive purposes?—There are occasional instances like that, but I should not say that there are very many.

30005. Are there many cases where an individual member of a society is turned out for practices of that sort?—I have not come across any instance of that kind.

30006. You have never known of a society turning a member out?—No.

30007. Have you ever known of any society turning out an individual member for any offence?—I have not come across any such instance.

30008. You told us at the beginning of your examination that you were Vice-Chairman of the District Board at Amraoti from 1916 to 1924. Is the District Board allowed by its rules to apply any of its funds to assist the co-operative movement?—No.

30009. Do you think that is sound?—Looking to the activities that the District Boards in Berar are called upon to discharge, I do not think they have got much funds left to assist the co-operative movement directly. They might occasionally give help which does not involve any expenditure, for instance, the use of their teachers as account writers and as supervisors of primary societies.

30010. When you were Vice-Chairman of the Board, was the Board sufficiently in funds to discharge its various responsibilities?—Leaving out communications, I think the Board was fairly in funds for discharging their other responsibilities.

30011. You could not manage the roads?—No, we could not manage the roads to my satisfaction for want of funds.

30012. Have the roads deteriorated since they have been placed in charge of District Boards?—In some places they have; but I should not say that the transference of roads to the District Councils has resulted in any deterioration as such.

30013. *The Raja of Parlakimedi*: You say some of the roads in Berar are not maintained in the same condition as they were before the District Councils took them over for lack of funds. Cannot the District Council levy a special cess for the maintenance of their roads?—They can; but the difficulty is taxation which is always unpleasant to anybody and when the Provincial Government itself is unwilling to do it, how can you ask the local bodies to do it? They are unwilling to do it.

30014. Roads are an important factor for several needs, are they not?—They are; I firmly believe that if we improve all the roads we will increase the wealth of the agriculturists by at least 25 per cent; but the difficulty is to find the money.

30015. *The Chairman*: For the capital charge or for maintenance?—For the capital charge; the interest charges can perhaps be met.

30016. *The Raja of Parlakimedi*: You mention that it is difficult to find labour for the maintenance of these roads?—Yes, in some tracts.

30017. You suggest there should be a law to enforce supply of labour?—What I really mean is this. The village people should have a good road at any cost. A big man should pay down the money necessary to pay for the labour, or if he is not a big man he should exert himself on the road. What we find is that generally the main roads running by the village are in good condition, but the approaches for a mile or a mile and a half from the main road are in very bad condition; there are pits and other things and when there are floods the whole traffic is held up.

30018. Supply of labour by enactment of law would not be popular you think?—It would not be; but vaccination was also not popular.

30019. Such a thing has been tried in certain parts of India where it was impossible to get labour. When it was laid down that so many hands must be supplied from each village it was very much criticised in the Legislative Council?—We have also got to educate the members of the Council in that respect.

30020. *Sir James MacKenna*: At the foot of page 246 in answer to Question 22 (*a*) you suggest: "It is for Government to see that money is made available for agriculture when it is not wanted for commerce and this can be accomplished by enabling the Imperial Banks to place their money at the disposal of co-operative societies or by starting an All-India Co-operative State Apex Bank". Then you say: "An attempt made in this Province in this direction failed because it demanded too large a price from the Central Bank and societies". Could you amplify that a little? I would like to know something about that attempt?—The latter part of that answer refers to the crisis that arose in the Central Provinces in 1920 and Government came to the relief of the co-operative societies and gave 20 lakhs of rupees, 17 lakhs to be given to agriculturists or members of co-operative societies as loans, and 3 lakhs to serve as fluid resources for the benefit of depositors. The terms imposed were that the Registrar of Co-operative Societies should determine, and he should be the sole authority for the purpose of determining to which of the societies these loans should be given; it was also suggested that all banks which got loans by these means should first exert themselves to collect money and apply it towards the repayment of this, irrespective of the obligations of the Central Bank in other respects; it was further suggested that the Registrar should be given special powers to remove Directors, etc. The non-official element, which is the chief element in the Central Provinces and Berar in the co-operative movement, naturally felt that this was a criticism of their work.

30021. That was what you meant by saying that the Government demanded too large a price?—It was not the supervision that was resented but the way in which the whole thing was attempted to be done. There was no objection to the supervision of the Registrar in general, as required by the Act, but the special supervision and the special powers and conditions that they wanted to lay down were considered not to be proper for the non-official people to work under.

30022. They resented the conditions imposed?—Yes.

30023. *Prof. Gangulee*: When was the Co-operative Institute in Berar started? And you have been the President since then?—At the end of 1922; Yes.

30024. Have you an institution undertaking any survey of the extent of rural indebtedness in Berar?—I have been trying to go round and visit the village societies and take survey of the economic condition of the societies as a whole.

30025. Into how many cases have you investigated so far?—I have investigated into the cases of 902 members comprising 35 villages and 57 societies.

30026. Did you do that work on behalf of the Institute or in your individual capacity?—As President of the Institute I did that.

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30027. Do you think that the indebtedness is increasing?—I should think it is increasing.

30028. Could you give us an idea of the burden of the total debt per acre on an average?—My survey of these village societies so far leads me to the conclusion that for every rupee borrowed from the co-operative society, that is, from the Central Bank, the agriculturist is indebted to the outside creditor to the extent of one rupee. That is, the outside indebtedness is equal to the indebtedness of the Co-operative Central Banks. At present the average indebtedness of a member in Berar is Rs. 600 and if you add another Rs. 600 to it as indebtedness due to outside creditors, it means that every member on an average is indebted to the extent of Rs. 1,200. Now the average holding in Berar is 20 acres and that means there is an average indebtedness of Rs. 60 per acre.

30029. That is more than what Mr. Darling found in the Punjab?—I think Mr. Darling worked out the figures for the Province as a whole; my figures are for the co-operative societies only.

30030. What is the price of land here per acre?—It varies from Rs. 100 to Rs. 400; it depends upon the quality of the land and its proximity to the village.

30031. *The Raja of Parlakimedi*: The maximum price is Rs. 400?—Yes, occasionally garden land might go up to even Rs. 500 an acre.

30032. That is for first class land, I suppose?—Yes. I am speaking of the prices of this year and last year. Of course prices are showing a tendency to drop.

30033. *Prof. Gangulee*: This investigation of yours was done in detail I suppose. Could you tell us what is the proportion of the debt to the assets of the family, on an average, in the cases you have investigated?—I have tried to do that. I tackled that problem by finding out in how many years an agriculturist with 20 acres will be able to repay without selling his estate, and I found that the majority of members would be able to pay all their debts in from seven to ten years, provided they were industrious enough and provided they laid by at least Rs. 8 per acre per annum.

30034. Is it your contention that co-operative credit societies are reducing the indebtedness of the village?—A good many members are trying to do that. But there are black sheep everywhere and these black sheep take some time to improve.

30035. But Berar is rather a prosperous tract?—I should think so.

30036. Is it your impression that within the last ten years the debt of the Berar peasantry has increased faster than that in the Central Provinces?—It has slightly increased because the people have been adopting a higher standard of life. They tried to have more comforts than their permanent income would allow.

30037. It proves, as Mr. Darling says, that debt follows credit?—In a way you might say that; but the increased indebtedness would not mean that the condition of the agriculturist is in any sense deplorable. What we have to see is the repaying capacity of the man.

30038. Have you been to the Punjab?—Yes, but only to the central Punjab and Lyallpur district.

30039. How is the movement there compared with that in Berar?—It is superior, and we have profited by the example of the Punjab; that is why I say that the Co-operative Department and the Government should help the non-officials and the societies by going round and seeing what other people are in a position to do.

30040. In answer to Question 5 (*a*), you suggest that all the resolutions adopted in the Conference of Registrars of Co-operative Societies held in Bombay in January 1926 should be given effect to. Did you attend the Conference yourself?—Yes.

30041. Did you approve of all the resolutions adopted by that Conference?—Yes; I think they were adopted after mature deliberation.

30042. With regard to the thrift societies that you propose to establish, have the co-operative societies in Berar, speaking generally, promoted thrift?—A good many members have learnt the lesson of thrift; but thrift is a virtue by itself and is a very difficult thing to practise. What I specially want by starting these societies is

to enlist the sympathy of the women folk in the movement. Mr. Calvert will tell you that in a village in the Punjab all the members of the society are women and, from the scavenger woman to the lady in charge of the dispensary, all are members.

30043. Has any beginning been made in that direction in Berar?—We are beginning now.

30044. How many societies have been formed?—We are just beginning; we had a ladies' conference in Akola and one of the resolutions they adopted was to start these thrift societies, consisting entirely of ladies and managed entirely by them.

30045. About this enforcement of the law of *damdopat*, did you not think that the Mahommedans would oppose such an Act? What I heard was that a measure of this nature was introduced in the Legislative Assembly by a Mahommedan gentleman some time ago. Some Mahommedans might be opposed to it; but a good Mahommedan in the sense of a Mahommedan who stands by his religion ought not to oppose it.

30046. What is your opinion of the Deccan Agriculturists' Relief Act?—The Deccan Agriculturists' Relief Act was an unnatural measure from the economic point of view, and it failed in its purpose. If you have had the advantage of reading the report of the Committee which sat, consisting of a member from the High Court Bench and others from Bombay, you will know that they have declared that the object of the Act has been frustrated in actual practice, and they recommended the repeal of the Act. It was an attempt to legislate on a matter which it is very difficult to deal with by legislation. The methods of moneylenders are very complicated; it could not succeed.

30047. It will not function under normal conditions?—No.

30048. What is your opinion of the Usurious Loans Act?—In actual practice it is very difficult to operate; it postulates proof of undue influence by the debtor to the satisfaction of the court. Undue influence, like fraud, is often very difficult of proof. Although in a particular case one feels inclined to think that undue influence has been practised, a civil court finds great difficulty going on mere moral proof. When undue influence is alleged, the Judge has to decide on the evidence before him and the great difficulty in seeking the protection of the Usurious Loans Act, from the point of view of the debtor, is in regard to proof. I do not know how far public opinion will support me in this, but I think legislation making the law of *damdopat* of universal application would be better than the Usurious Loans Act.

30049. Can you tell us more about your activities with reference to the training of subordinate officers in the co-operative movement; what procedure do you follow in training these men?—The procedure we follow in the Institute is based on the Punjab model. When I visited the Punjab I found there a regular system of training these men, and retraining them from time to time on the various aspects of their work. We are maintaining classes in the Institute; we bring together people of various grades and mental calibre in different groups and hold classes for them; for instance, the account writers are put together in a separate class. The rural directors of banks are assembled together and are taught the elementary principles that they have to keep in mind when they visit societies. The members of the societies are assembled together in a different class. There is a class for the officers of the Central Banks, and we even had a class for the Government Auditors which was assisted by the Co-operative Department and run by the Institute.

30050. Do revenue officers attend classes?—No.

30051. Do *patels*, *patwaris* and such officers attend classes?—No. If they happen to be members of co-operative societies, for instance, as headmen of the society, they come in that capacity, but not as *patels* and *patwaris*.

30052. Have you translated any book on co-operation into the vernacular of the Province?—There are a number. Marathi is the vernacular language of that part of the country from which I come, and in that language the Act, the rules, and the principles of co-operation have been published in various forms in small pamphlets which we issue from time to time. We get them read; one of our great points is that we issue a monthly magazine in which we deal with various aspects of the the movement which arise; we deal with these matters in small notes and we see that those notes are read, or at any rate, explained by some member of the society.

30053. There has been a good deal of discussion as to the assistance that can be got from non-officials. Would you agree that the non-official assistance hitherto given has been rather spasmodic in character?—I think that is rather a strong word to use; of course, it is not as constant as the work of a whole-time paid man would be, but I should not call it spasmodic.

30054. Has it been lacking in certainty?—Yes, that is so. But, whatever the reasons may be, however silly those reasons may be, non-official advice is more likely to be listened to, and therefore non-official advice is valuable.

30055. Do you know of any non-official organisation as a corporate body helping the co-operative movement, such as the Servants of India Society in Bombay?—There is none in the Central Provinces.

30056. Have you any suggestion to make where by this co-operative movement could be made more attractive to the non-officials?—The only suggestion I should like to put forward is this. I have my own ideas on the point, and I have always advised the Central Banks to separate their finance activities from their educational and propaganda activities; the financial activities require constant attention, and naturally the managing board or the working committee are keen to see that money that is advanced is safe and is called in at the proper time; they have no time left to devote to education and propaganda. I am trying to advise members to set up education committees on which men could sit irrespective of whether they held a sufficient number of shares to enable them to become directors. Economics graduates have been coming into prominence in the movement lately, and if they were asked to go out into the villages and take an interest in the movement, I think they would do so.

30057. Do you think college students are taking an interest in the movement?—Yes, they are. Students from the King Edward College at Amraoti have assisted us in going out to villages and teaching the village people the advantages of thrift and of co-operative societies.

30058. You are all the time talking of the Berar co-operative societies?—Yes

30058-*a*. Have you any experience of the co-operative societies in the Central Provinces?—I have seen some of them, but I should not like to commit myself on a matter about which I do not know very much.

30059. You say your societies touch the lower strata of small agriculturists?—Yes.

30060. Is that your experience in Berar?—Yes. Of the 902 members that I saw I found that 400 were persons whose holdings were from 1 acre to 15 acres. I call them small holdings; they are really uneconomic holdings. I find there were 186 members whose holdings ranged from 16 to 30 acres. I call a holding of from 31 to 50 acres a large holding; it is not really a large holding, but it is large from the point of view of the people in Berar. I found there were 60 members whose holdings were between 51 and 100 acres. I found 33 members whose holdings were over 100 acres. I found 137 members who had no holding at all and yet were members of co-operative societies simply because they were regarded as good people who could be trusted with an advance of money in view of their exertions and character.

30061. In the Berar societies what is the method of recruiting Circle Auditors?—There is no special method in Berar; the department is one for the Central Provinces and Berar.

30062. What type of people are they?—They are recruited in the same way as all Government officers; there is no special qualification. In the Punjab special qualifications are put down. Mr. Calvert explained it to me when I was there. If the Central Provinces and Berar follow the same system, earlier and better results will be obtained.

30063. *Mr. Calvert*: In dealing with education, you say there is a general disinclination amongst teachers to do field work; you further say that you have not got teachers who can or will teach agriculture; and further you say that teachers feel no interest in nature study. Do you not think those three points are arguments in favour of drawing teachers from the rural classes?—Yes.

30064. And yet you are not convinced by your own arguments?—I would not insist on teachers being drawn from the rural classes, because there are other difficulties. A teacher drawn from the agricultural class has not the same cultural education as a teacher drawn from better class people; if an agriculturist who comes from the bottom strata of society is called upon to teach languages, his system of teaching Marathi, for instance, will be far less efficient than that of a teacher from a higher strata of society. I should not insist on the teachers being drawn from the agricultural classes, though I should like teachers to attend classes for six months to get the necessary qualifications to teach the rudiments of agricultural practice.

30065. Which do you think would be better in order to give a rural bias to education, to train teachers or to get teachers from the agricultural classes?—Of course a man bred up in a village will be able to do it much better, but the difficulty is to find out the right man to serve both purposes.

30066. Among the causes of borrowing, would you put the willingness of the moneylender to lend?—In a way I would; the willingness of the moneylender is sometimes a cause of indebtedness, but I should not regard it as a very great factor either in the existence of indebtedness or in the increase of it.

30067. But the moneylender is often willing to lend money on ordinary book credit without security?—I do not find that in Berar; in fact, in view of the insolvency law I have told people that they should not advance money on no security.

30068. I do not quite understand why a strong supporter of co-operation like yourself should advocate a non-co-operative village bank?—I am speaking of the agriculturist in general; we are not willing to force co-operation on people who are not prepared to accept the benefit of co-operation, and I think if we can make a provision of that kind, it may be possible for us to meet the needs of agriculturists, because many people are unwilling to accept the unlimited liability principle which is the basis of all our co-operative societies in Berar; there are people who stand out because they do not want to accept the principle of unlimited liability to which they are subject when they become members of a co-operative society.

30069. How would you have limited liability without the Companies Act?—I would merely try to do away with certain restrictions of the Indian Companies Act; I do not desire to abolish the Act as a whole. There are certain restrictions on banking companies, and I should like those principles to be slightly modified.

30070. They are very slight?—Not in actual practice; we find people do not want to start banks.

30071. The Companies Act is designed to facilitate the formation of companies?—It is, but with regard to banking there are certain restrictions; the Act was amended after the banking failures of 1913: the Government of India became overcautious in that matter.

30072. But your village banks would have to be audited?—Yes.

30073. They would have to keep accounts?—Yes.

30074. They would have to publish a list of members?—Yes.

30075. Would it be a body corporate?—Yes, it would be a body corporate otherwise it would not be able to sue, and it would have to institute suits.

30076. And you would have to have provisions for liquidation?—Yes.

30077. So that you would have to have the main provisions of the Companies Act?—Yes, but I am specially referring to the provisions with regard to banking, which require a certain minimum number of members and certain forms of responsibility of directors which are in excess of the requirements of ordinary companies.

30078. The Companies Act has only two provisions as regards banks: it requires a six monthly statement of accounts?—In a particular form.

30079. And it requires the names of all managers to be published; those are the only special provisions relating to banks in the Companies Act?—And there is a provision as to the minimum number of members.

30080. Seven?—I think for banking there have to be twenty.

30081. You are thinking of section 4 with regard to prohibition of trading?—Yes.

30082. That would be the general law of the land still, would it not?—Yes, it is the general law of the land; I am suggesting that merely as a measure which may be tried in certain cases.

30083. You suggest fixing a maximum rate of interest; under what penalty would you enforce that?—The penalty would be that any interest which went beyond 3 per cent would not be decreed by a civil court; it would be regarded as a contract which was void and unenforceable at law.

30084. Among your sources of credit, is there the wandering cattle dealer; does he sell cattle on credit?—Occasionally, but not much in Berar.

30085. There is no such system in Berar?—No.

30086. Does the village jeweller do pawnbroking?—Yes, some of them do.

30087. Would you be in favour of a legislative measure insisting upon money-lenders keeping accurate accounts on paged books?—I should have no objection to that.

30088. And in readable script?—Yes, I have no objection, but as a matter of fact in Berar they have to do it because they have got to prove it in a court of law. Readable script may mean Marwari script also which Marwaris only would be able to read. But if the idea is that there should be a common script then I think that there will be some difficulty about it.

30089. On the question of arbitration, you again suggest an alternative to the co-operative method. Is that due to lack of faith in co-operative societies?—No; but there are no arbitration societies such as you have in the Punjab. My point is that societies like those should be established and started here. At any rate, an arbitrator should be appointed by the Registrar to relieve him of the duty of giving awards, which duty I am told is increasing very much.

30090. You say that the Registrar should be an Indian. Is that opinion inspired by the sad memory of your visit to the Punjab?—Mr. Calvert is more Indian than an Indian himself. He knows the conditions of Indians better than they know them. When I came back to Berar I told people that Mr. Calvert was a missionary and that the success of the co-operative movement was due entirely to him.

30091. In suggesting that Government should assist land mortgage banks, is it your idea that they should guarantee the interest on debentures?—Yes, to a certain extent at the beginning of the movement.

30092. We have had actually before us two alterantive suggestions: one is that Government should invest in debentures and the other that they should guarantee interest on debentures. Which do you think would be advisable?—That would vary from Province to Province. In the Central Provinces and Berar, it would be difficult for Government to raise necessary capital from the sale of debentures locally.

30093. You have no experience as to what the effect would be of a Government guarantee on debenture?—No.

30094. Do I understand that your Central Banks or Provincial Banks have found no difficulty in getting the Imperial Bank to discount their paper?—In fact they are not willing to do it. We tried to discount it in the beginning of the movement but they felt that they were prevented by law from discounting our paper. What they do is to take hold of our promissory notes and give money against them. They advance more on the security of the Government Promissory Notes that we hold.

30095. You ascribe the weakness of the primary societies in the Central Provinces and Berar to the neglect of education?—Yes.

30096. Do you think that the situation could be much relieved by a system of education of members. Is this what you are aiming at now?—Yes.

30097. Does your auditor not hold a general meeting of the society after the annual audit and explain the whole finance to the members?—I do not think that he does.

30098. Have you in Berar any societies amongst village menials of landless labourers?—No.

30099. Would you like the societies to be permitted to spend up to one-fifth of the annual profit for certain necessary objects ? We were told yesterday that they already spend about 40 per cent for an audit and 15 per cent for the Institute, and another 20 per cent would leave very little for reserve funds ?—They pay 15 per cent of their profits to the Berar Institute.

30100. And a certain amount to the audit fund?—I do not think that they pay anything to the audit fund. In Berar the societies which are members of the Institute are called upon to pay 15 per cent; societies which do their own writing up of accounts are given back 7½ per cent. My point is to allow the societies to feel that they have got the power over their money for very necessary objects. In villages the difficulty is that there is no common place for holding meetings, unless the meetings are held in the houses of *sirpanches* or other members. If they cannot rent a house, the Registrar should allow that. I have spoken to the Registrar myself and I think that he is favourably inclined in that direction.

30101. I have usually found a tree for this purpose?—It is not very easy, usually, to hold a meeting under a tree because in some villages you will not find a single shady tree except the *Acacia Indica*.

30102. After you have put your faith on education for the improvement of primary societies, you go on to propose that the Land Revenue Code be amended in order to make the sums due by members recoverable ?—Yes, I have proposed that as an *ad interim* measure. I am trying to advocate that merely as an encouragement to the movement during its infancy.

30103. You will still rely on education for your main support?—Yes.

30104. Have you any recollection of the new Bombay Co-operative Societies Act?—I have casually gone through it.

30105. They have allowed the first claim to the landlord and to land revenue. Subject to those two claims they have given the society the first charge on the assets of the member. Does that meet your wishes?—I think so; it will go a long way in that direction.

30106. Do you find any difficulty in this Province about your awards being executed in civil courts. Do civil courts delay proceedings at all?—No. The only difficulty we find in actual practice is that of selling land. The present circular of the Judicial Commissioner lays down that the auctions of these lands are to take place at certain stated places in a taluka, and that circular leaves the discretion to the courts to have the auction done at the village, and instances have been brought to my notice where the selling of land at a place different from where it is situated has resulted in some loss to the member. We are trying to get that circular slightly modified. Beyond that I do not think that the civil courts have stood in our way.

30107. Have you really had to auction lands to recover debts?—Occasionally.

30108. *Mr. Kamat*: In answer to one of the questions you say, I should insist that a teacher should have gone through a course of agricultural education before he was confirmed in his appointment. Would you insist upon that in the case of all the trained teachers as well?—I have put it rather too broadly, I think. I would not insist on it in the case of every teacher, but there may be a selected grade of teachers for instance who should be called upon to go through this education and serve on village schools wherever started.

30109. It would not be quite a feasible proposition to insist on every teacher being sent for agricultural training, would it?—No; probably it would be beyond the competence of the Local Government to do that at present.

30110. Talking about demonstration and propaganda you say, on page 242 in answer to Question 3 (*c*), "That advice given by experts" (I presume of the Agricultural Department), "must be demonstrated to be beneficial: But what often happens is tha the advice to be followed either requires large expenditure or does not give certain results. Taking works on contracts and doing them cheaply is the surest way of convincing agriculturists." Would you kindly amplify that?—For instance, take the tractor plough which we are told does the work more economically. What we want the Agricultural Department to do is to take on contract, say, 100 acres in a village and actually do the work at a cost which would be much less than would be the case if

the agriculturist did it in his own way. If that were done, there would be no difficulty. In fact I was so sanguine about it that I actually offered the proposition to a certain responsible gentleman of the department. I said that I would carry out tractor ploughing on a dozen acres and I put down the money in advance, but the offer was not accepted. The real difficulty about these innovations, so far as the agriculturists are concerned, is that they are disinclined to go in for improved methods until they are satisfied that they are really going to be cheaper to them.

30111. Do you mean to say that your offer was not accepted by the Agricultural Department?—I did not extend a challenge to any expert or other officer of the Agricultural Department. I thought that by telling a responsible officer of the department some good might result from it. But as I say there is a good deal of unwillingness displayed in this matter.

30112. Did that have a very bad effect on the agriculturists?—No; there are some agriculturists who do the work cheaper by this method. Big landlords and other people find ploughing by tractor much cheaper than the ordinary method of ploughing. What I do say is that you must demonstrate the new methods to the agriculturist and show him that they are cheaper than his old methods, and where this has been demonstrated the agriculturist has readily adopted them. For instance, the iron plough is a common feature in Berar now; it was not known five or seven years ago. The disc harrow is another instance.

30113. Has that been adopted to the needs or interests of the agriculturists in this part of the country? Or are the people using the ordinary standard ploughs? Has there been any change in the design so as to suit their special needs?—They are using those ploughs which by experience have been found to be best suited for instance, ploughs manufactured by Burn & Co. and Kirloskar Brothers have been adopted, and there are no complaints about them.

30114. Speaking about co-operation you throw out a suggestion that there should be co-operative societies for curtailing ceremonial expenditure on social customs, etc. These are to be in addition to your thrift societies?—Yes; I saw some societies in the Punjab which aim at this and I saw some societies which incorporate restrictions on expenditure in their byelaws.

30115. You gave certain replies to Mr. Calvert about your suggestion for the formation of village banks and exemption from the Indian Companies Act. I am sure you remember the Indian Companies Act was stiffened after the bank failures during the crisis of 1913. The object of stiffening it was to provide closer supervision and certain strict conditions. You want to go behind that?—That is why I limited the capital to Rs. 25,000.

30116. Even then for a village bank Rs. 25,000 is not a small amount. Do you think the village people would lose that money?—No, nor do I apprehend its loss because it will be under them directly and the supervision will be very strict. As the people would be living in the villages, they would know where the money was going to and they would not speculate.

30117. Speaking of the restriction on the maximum rate of interest to be charged by moneylenders and the law of *damdopat*, you suggest that 36 per cent per annum should be the maximum rate of interest. Do you not think that that is a very high rate?—It is; but considering that the rate of interest goes up sometimes to as much as 75 per cent or even more at the rate of one anna per rupee per day, I thought that my suggestion would be welcome and would not be criticised as being too hard upon even the very small moneylender.

30118. If 36 per cent were to be accepted, what will happen is that in three years the amount will be doubled, including the interest, and the man will go to court to exact the amount so that the debtor will have to pay this very high interest?—What I suggest is not that 36 per cent should be the ruling interest but anything exceeding 36 per cent should be declared null and void. I do not think a provision of the law which said that any contract which contained a demand for interest higher than 36 per cent would be regarded as void would have a bad effect.

30119. With regard to economic enquiries as to primary societies, did you visit the societies personally?—Yes. I visited 57 societies situated in 35 villages in the four districts of Berar.

30120. Was that during your spare time?—Yes, and occasionally also at the sacrifice of my own work, though I should not say that.

30121. You speak of the Taluka Development Associations in Bombay and you wish something like that to be established in Berar. Is it not the case that you have here Agricultural Associations in the district, in the taluka and in the tahsils and also lower down?—There are Agricultural Associations, but their activities are confined to a very narrow sphere and many of the associations are not really working.

30122. If your existing machinery is not working well, do you think there will be any advantage in copying the Bombay model?—The advantage, I am told, of the Bombay type is that the Co-operative and Agricultural Departments combine and the Taluka Development Associations take up the work of both.

30123. Do you suggest that they should be under the guidance of the District Officer?—Yes, I would welcome that idea.

30124. You think the presence of the District Officers at these meetings would stimulate the non-official members and secure their more regular attendance?—I do not think so. I do not think the non-official members will attend merely because of the presence of District Officers.

30125. Then what is the advantage of the guidance of the District Officers?—The advantage is that the District Officers are touring officers and when they tour in the villages they get into touch with the people more closely and they will be able to give advice. That is why I say we want sympathetic District Officers not merely to dictate but to help and guide.

30126. While talking about the cotton sale societies, you say that *adtyas* should maintain a register showing the rate they have secured for each cart sold to the buyer. Will you explain what the process is here, and what part the *adtyas* play in securing good rates as commission agents for the seller?—What happens is this. In the market in the morning the *adtya* gets, say, 100 clients who bring him 200 carts. He has thus 200 carts to dispose of, and there are 5 or 10 big merchants willing to buy. Then he negotiates the rate with the purchaser or his agent. If the purchaser is not present in person (and the Ralli Company's agents are not always present in person) his agent or nominee is in the market. He sees the quality of the cotton and then quotes a certain rate, and if the agent of the cotton grower, *viz.*, the *adtya*, is not satisfied he says that this is not a proper rate, that the quality is higher, the lint percentage larger, and so on, and he asks for a better price. Some sort of bargaining goes on and the rate is settled. What happens then is that they begin to weigh the cotton and part of the cotton is tipped out of the carts on the heap of the purchaser and then, when the cart is, say, half empty, purchaser takes objection to the quality and says when he quoted his price it was for a better quality that the cotton turns out to be. He says he is not willing to pay the rate he quoted in the morning and that he wants a discount. Naturally the cart being half empty and the cotton thrown on the heap it is very difficult for the cotton grower to take it back again, so he is forced to abide by the wish of the purchaser, with the result that the cotton grower is not able to get fair price for the time. What happens there in the evening is that the *adtya* goes to the offices of the cotton buyers and says "I am receiving a great many complaints from my clients. They say they are not receiving a fair price." Thereupon some sort of compromise is arrived at at night. They say to the *adtya* "We quoted you 85 on an average for 100 carts; we will give you 90." The difficulty is that the *adtya* pays the money in advance and has given the price for each cotton cart from his shop soon after the cotton is weighed, for as soon as it is weighed the grower goes to the shop of the *adtya* and receives his money, and then goes back to his village. When the *adtya* recovers his money, either that night or next morning the difficulty is to distribute it among all his clients. He cannot do it, so he picks out the men who have howled most the previous day and who he thinks are his canvassers and satisfies them.

30127. Is there no method of finding out the fraud and giving the correct price to the grower from the debit the agent makes in his books in the evening? The books of Ralli Brothers will show the actual amount they have paid?—They do, but the difficulty is that the cotton grower cannot examine the books of Ralli Brothers. I do not think the books of Ralli Brothers would be open for inspection by these villagers, and in any case, each cotton grower cannot go and compel them to show him their register.

30128. While talking about general education, you say that local bodies are unwilling to enforce the provisions of the law with reference to compulsory primary education. Is that your experience?—Yes.

30129. Who is standing in the way now so far as the introduction of compulsory primary education is concerned, the local bodies?—I would rather say the Local Government.

30130. Surely not?—Yes, by enacting the laws they have.

30131. Will you please explain that further? How is it the Local Government is responsible and not the local bodies?—What the local Act requires in this Province is that before compulsory education is extended to any village the local authority or the local body has to make an application and the local authority or the local body has to satisfy Government as to the feasibility of the scheme and they have to make out elaborate calculations as regards the number of students, the accommodation and the quota the local body is able to give. All that takes at least six months and, education being unpopular in the villages, objections are raised in the villages, because the scheme is published for criticism. If strong objections are raised in a particular village, the local body asks leave to take back their proposal and the whole scheme falls through. On other occasions, when the proposal goes to the Local Government, difficulties are raised that the accommodation provided is not sufficient, and that the District Board or Council will have to pay a larger quota, and in calculating that strict care is taken to extract the full pound of flesh from the District Council. I do not mean to make any aspersion on the Education Department, but in making calculations on the financial side of the question great care is taken that charges which are debitable to compulsory education on the strictest calculations and considerations are put down. What I want is if education is to be made compulsory in every village, local bodies should only be asked to contribute a certain portion towards it which they can afford to do out of their own funds and Government should compel villages to go in for the scheme. If that were done, compulsory primary education would spread much faster.

30132. *Sir Thomas Middleton*: You refer to the reckless leasing of lands. Is the practice of leasing lands a very common one in Berar?—Yes, very common.

30133. You talk of co-operative societies containing a number of persons who are not landowners? Are most of them tenants of lands?—No. They are generally labourers in the fields. A person who has no land of his own is rarely given land on lease, because the landlord wants some security for his money.

30134. You think a considerable number of people who take land on lease in Berar do not become members of your co-operative societies and are not assisted by them?—No. Our co-operative societies are very small. For instance, their membership extends from 10 upwards, and the maximum that I have come across in Berar is 50.

30135. You refer to the increasing use of cowdung as fuel in Berar. I understand you have been in the Punjab and I also understand that in the Punjab the practice is to use cotton stalks as fuel to a large extent?—Cotton stalks are also used as fuel in Berar.

30136. I am told that in the Punjab they do not burn cowdung in many areas because they use cotton stalks?—If the Punjab is not doing it, then they are showing more sense. What I find is that cowdung is used to a large extent in brick kilns. My impression is that they could just as well use other kinds of fuel. In the brick kilns they burn cowdung because it is cheap. Every man looks at his own occupation solely from an economic point of view; he does not care whether agriculture benefits or not.

30137. In answer to Question 17, you give a detailed estimate of the time that a labourer or cultivator wastes?—As spare time.

30138. How did you get those figures?—By observation and by enquiry. I have been going into the villages, and I know at what hour they go out into the fields and at what hour they return. Of course I do not say that it is accurate to a point, but it is largely correct.

30139. Have you made enquiries about this from others?—I have made enquiries from the cultivators themselves. In fact, one of the subjects that is going to be discussed at the Co-operative Conference, which is to be held on the 22nd and 23rd of this month, is this question of spare-time occupations.

30140. In answer to Question 22, you give us the rates which your banks charge on money lent; have your terms much reduced the rates of interest that were formerly current?—Yes. In fact, the influence of the co-operative movement has gone to this extent that in every village where there is a co-operative society in existence, the moneylender is not prepared to quote a higher rate of interest lest his client would become a member of the co-operative society.

30141. Do you regard that as one of the most useful functions of your society?—I think so.

30142. Reducing the general rate of interest?—That is not our aim, it is an advantage.

30143. In answer to Question 22, you say that if these co-operative shops for selling cotton are to stand in competition with the existing *adtyas*, there must be some change in the system?—Yes.

30144. I do not quite understand what that means. Do you mean that the *adtya* is offering to sell at a lower rate of commission than your shops charge and then makes a profit by falsifying the weight?—No; no doubt the profits of the *adtya* consist on occasions of these false weighments that he has done, but that is not the only thing. The second thing in the large amount of undistributed money that he gets from the purchaser. As I explained to Mr. Kamat, he gets a certain amount of money from the purchaser but he does not distribute it among the people who have brought in cotton carts. He has got an extra sum with him which he distributes out in doles for encouraging canvassers to get him new custom. That is not really his amount; it is the amount of each cart owner who has brought cotton, which should really go to him. This undistributed money is the *adtya's* gain and with that money in his hands he has naturally got an advantage. For instance, he can say to the cart owner: "If you go to the shop controlled by the co-operative society you will only get Rs. 84, but I am prepared to give you Rs. 85 or Rs. 86, if you come over to my shop" and the money which he pays comes from the fund he has accumulated by these means.

30145. In answer to the question on general education, you say that parents often complain loudly that education in primary schools unfits children for work in the fields. Do you think that that is a just criticism, that it unfits them, or is the parent complaining that their time is occupied?—It is not a just criticism, but that is the criticism; it is a fact that there is a general disinclination, on the part of these village boys to go to their own fields; that is a thing which I have observed myself.

30146. Then it is a just criticism from the parent's point of view?—Yes; the remedy lies in giving an agricultural bias to the boy, and in teaching him the dignity of labour.

30147. Is there compulsory education in any district in Berar?—In every district there are some villages where there is compulsion. For instance, in Amraoti there are 10 villages where compulsion has been introduced.

30148. How is school attendance enforced?—There is a fine of Rs. 2. There is an attendance committee which looks after the attendance of boys; if a boy has absented himself and the reasons are not satisfactory, a prosecution is launched against the parent and he is fined an amount not exceeding Rs. 2.

30149. Is that method found to be satisfactory with all classes?—As a matter of fact, that method has not been put into actual practice. There are not many such cases, because the District Board is also trying to feel its way as to how far education should really be made compulsory.

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30150. *Dr. Hyder*: With regard to this question of middle-class youths and agriculture, do you not think that these boys who come out of high schools and colleges would be too soft-handed to like agriculture?—Yes, if the present ways of education are continued, they would be.

30151. You say that agriculture should be taught without being tiresome?—What I really mean is that if they are taken out into the fields, then there is some kind of diversion to them. If it is merely taught in the school room it becomes tiresome. Nature study on a school table is hardly nature study. Agriculture explained by books, diagrams and blackboards is no agricultural instruction at all.

30152. Do you not think that publicity is a great factor in everything?—It should be.

30153 Here your proposal is that the village banks should be exempted from the operation of the Indian Companies Act. You want to do away with the system of submission of statements of accounts?—I do not object to that. I am only suggesting that there should be no strict enforcement of particular forms which are insisted upon in the case of the larger banks.

30154. What are the privileges which village banks would obtain if they were given this exemption?—It would merely be an exemption from filling up certain forms, and they would be free from rigid compulsion in certain matters.

30155. Exemption from the Indian Companies Act?—And from certain rules framed the by Local Government prescribing certain forms.

30156. You are not in favour of the abolition of returns?—I do not object to the statements being published.

30157. With regard to the question of implements, you say that they could be popularised if steps were taken by Government to do so by the help of the Agricultural Department. Do you really think there is great scope for the use of such machinery?—I think so. Speaking for Berar there is scope for it. Take the winnowing machine and chaff-cutter for instance. An agriculturist in the interior finds that his time is wasted when there is no wind to separate the chaff from the corn; the winnowing machine will be of great help to him, and with the aid of the chaff-cutter his fodder supplies will increase.

30158. If these machines become popular, the question of means arises. Supposing the cost of the machinery is not within the means of the cultivators, what measures would you suggest in order that these mechanical appliances may be taken up by the agriculturists?—My suggestion is that they should unite themselves into co-operative societies for the purpose of purchasing these machines, and lease them out. I have seen a village where they have purchased an iron plough in the same way; it did not cost them more than Rs. 50, and they are now leasing it out at certain rates per day.

30159. You think there would be work enough for a set of people who own these tractors and chaff-cutting machines?—Yes.

30160. Even if they were conducted for private profit?—Yes.

30161. Such kinds of things are used in other countries; do you think it is possible for the small peasants here?—Yes.

30162. You want to make village life more attractive by increasing amusements. What do you include under amusements?—I would include magic lantern shows, cinemas and gramophones.

30163. On what do the mill hands spend their earnings?—I cannot tell you, because I have not got much experience of mill hands; there are very few mills in Berar.

30164. *Mr. Wills*: As regards the working of the law of *damdopat* in Berar, it is not an absolute limit, that is to say, it applies every time the accounts are made up; is that correct?—It is applied every time that a suit is instituted.

30165. Supposing a creditor and debtor come to an agreement and write a fresh bond, it applies again?—No.

30166. It applies on the original basis?—On the new basis, that is the ruling of the Bombay High Court, which I consider a retrograde step.

30167. The result is that the creditor is in a powerful position; he is able to get his bond renewed, so that in actual fact the interest would be many times in excess?—It should be enacted that in cases like this the real cash advance in the first instance should be considered.

30168. Would you recommend an amendment of the law, or the extension of the present law to other parts of India?—I would advocate the passing of a new law altogether.

30169. *Mr. Kamat*: On this question of cowdung fuel and making of bricks, are not ashes thrown out in the neighbourhood of railway engine sheds by the railway engines? That naturally, if utilised, would save a great deal of the cowdung?—Not much. In places where the carting of the ashes is expensive, it would not pay them.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Saturday, the 22nd January*, 1927.

Saturday, January 22nd, 1927.

NAGPUR.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.

Sir JAMES MACKENNA, KT., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO of PARLAKIMEDI.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. B. S. KAMAT,

Mr. C. U. WILLS, I.C.S.
Sir SHANKAR MADHO CHITNAVIS, Kt., I.S.O. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr F. W. H. SMITH. } (*Joint Secretaries*).

Mr. D. O. WITT, Chief Conservator of Forests, Central Provinces.

Note on the Relations of Forestry to Agriculture.

1. *Methods of working the forest and the preparation of working plans.*—When a new working plan is prepared for a Forest Division, the local agricultural population is chiefly affected by the allocation of the coupes to be felled in successive years and by the consequent closures to grazing. It is a primary duty of the Working Plans Officer to arrange his coupes and consequent grazing closures in such a way that the local population shall enjoy adequate and reasonable grazing facilities. While almost, all grazing is more or less harmful to the forest, it is recognised that it is the duty of the Forest Department to assist agriculture by the provision of reasonable grazing facilities, and the prescriptions of every working plan give effect to this principle. The successive annual coupes are therefore arranged in such a way that in each year an approximately equal area of forest and an area equally conveniently situated is made available for the grazing of each group of villages adjoining the forest. Strictly sylvicultural requirements are in fact frequently sacrificed or subordinated to the needs or customs of the local agricultural population and in order to ensure that the grazing prescriptions of a new working plan are reasonably liberal and convenient and are likely to cause no discontent or hardship, these prescriptions do not receive administrative sanction until they have been carefully investigated and reported upon by a Settlement Officer appointed by the Revenue Department. This officer, in company with the Working Plans Officer, tours throughout the area likely to be affected by the provisions of the working plan: he calls for the villagers who enjoy grazing or other privileges in the forest and to them he fully explains the proposals of the Working Plans Officer. He hears their point of view and any objections they may wish to raise to the grazing closures proposed, and it is his duty to reconcile, as far as possible, their demands with the sylvicultural requirements of the forest, as laid down by the Working Plans Officer. He also satisfies himself that the grazing rates, whether privilege, ordinary, or commercial, proposed by the Working Plans Officer, are not unreasonably high when compared with the means of the local agricultural population and the rates which they have been accustomed to pay in the past.

It is likewise the duty of the Settlement Officer to ascertain that the annual coupes are so situated that the local demand for firewood or building material can be satisfied and that the coupes are in no year unreasonably remote or difficult of approach. By the appointment of a Settlement Officer the Local Government thus makes adequate provision to supply the needs of the local agricultural population both as regards grazing and as regards fuel and other forest products.

2. *Fixation of grazing rates.*—The rules governing the fixation of grazing rates are printed as Appendix XIV of the Central Provinces Forest Manual. The principle underlying these rules is that every genuine cultivator shall be allowed to graze four cattle for each working plough at merely nominal rates, known as privilege rates. The privilege rate varies from 1 anna in Mandla to 3 annas in parts of Nagpur Division. Thus the ordinary poor cultivator, owning one plough of land and less than five cattle, is only called upon to pay 4 annas to 12 annas for grazing for his cattle for the whole year, or approximately one day's pay. If he is slightly more prosperous and owns more than four cattle or if he owns a buffalo, he is charged ordinary rates for this excess. Ordinary rates are fixed at about three or four times privilege rates and an agriculturist is permitted to graze at these rates a number equal to the number which he is permitted to graze at privilege rates.

Any cattle in excess of those permitted to graze at privilege or ordinary rates must be paid for at commercial rates which are fixed at approximately the real commercial value of the produce removed from the forest.

From this it will be seen that while the poor cultivator is allowed grazing at rates which are purely nominal, the more well-to-do tenant is called upon to pay for his excess cattle on a sliding scale in proportion to his means and to the size of his herds.

It is here necessary to point out that notwithstanding the general rise in prices since the War, the grazing rates have as yet hardly anywhere been enhanced and that where such enhancement has taken place it has been very small and hardly in proportion to the increases prescribed in new Land Revenue Settlements. Thus, in the South-Raipur Sal Forest Working Plan, the privilege rate was increased only from 1 anna 6 pies to 2 annas. It may be contended that an increase of 25 per cent is sufficiently severe, but when it is realised that this increase means that the poor cultivator, owning one plough of land, will only have to pay 2 annas more (or half a day's work) for the grazing of all his cattle for one year, then it will be agreed that the grazing enhancement has erred rather on the side of moderation than of excess especially when compared with the much heavier enhancement proposed in the Revenue Settlement which is now under consideration.

The result of charging merely nominal rates for agricultural cattle is a very considerable monetary concession which amounted on the average to Rs. 10,74,500 per annum for the last five years.

3. *The number of cattle grazing in the Central Provinces forests.*—The following figures show the number of cattle grazed in Government forest during the last three years and the revenue realised from the sale of grazing licenses :—

Year.	Number of cattle grazed.	Amount of revenue realised.
		Rs.
1922-23	3,131,898	11,91,851
1923-24	3,388,833	12,93,384
1924-25	3,526,527	13,97,526

The increase of 400,000 cattle and Rs. 2 lakhs of revenue, which followed on a corresponding decrease in the years immediately preceding, is due to a succession of favourable rainy seasons and a consequent increased prosperity of the agricultural population of the Central Provinces.

NOTE.—In the five years' period 1914 to 1919, there had been a decrease in the number of cattle grazed from 3,956,717 in 1914-15 to 3,244,709 in 1918-19. In 1919-20 the number grazed was 3,203,759.

The reduction may be attributed to—

(1) Heavy mortality of cattle in 1917 and 1918.

(2) Cattle owners resorting to private forests where there are no restrictions.

(3) Dearness of grain and other necessities of life, coupled with scarcity of fodder in 1918-19, which induced people to dispose of many of their surplus cattle.

The Forest Department is being continually pressed mainly by short-sighted politicians to still further increased grazing facilities.

The fallacy of a policy of unrestricted grazing has been clearly recognised by Government and the Agricultural Department as may be seen by a perusal of paragraph 6 of Government Resolution on the Report on Forest Administration for the year 1924-25, which reads as follows:—

"At the request of the Local Government, the Board of Agriculture considered the rival merits of the Government policy of the limitation of the number of cattle to be admitted and of unrestricted grazing subject to a fee and the Board gave its unequivocal support to the former. The admission of unlimited numbers of cattle would be as detrimental to the cattle as to the forest and in the interest of both, the existing restrictions must be retained."

That the existing restrictions are far from severe may readily be understood from a perusal of the figures given above, which show that in the last three years there was an increase of nearly 400,000 or about 12 per cent in the numbers of cattle that grazed in Government forest. If it be acknowledged that the cattle owned in 1922 were already at least sufficient in numbers for the cultivators' needs, then a policy of increased restrictions, not of their relaxation, is clearly indicated in the best interest of the agricultural population.

The following figures show the areas closed and open to grazing in the Government forests of the Central Provinces during the year 1924-25. From these figures it will be seen that the closures are so arranged that approximately 1/5th is always closed and 4/5th of the total area is always open to the grazing of buffaloes, cows and bullocks:—

Area closed to grazing	...	3,382 sq. miles.
Area open to all animals	...	4,326 ,,
Area open to all animals except browsers (*i.e.*, camels, sheep and goats)	...	11,877 ,,

When it is remembered that in some Provinces, *e.g.*, Bihar and Orissa, no cattle are permitted to graze in any A class reserve, the extent to which the Central Provinces Government has gone in providing grazing facilities is obvious.

Experiments in the supply of baled grass for stall-feeding.—As a result of a Conference held in 1909, orders were issued to Conservators in 1910 to undertake experiments for the supply of baled grass from various forest divisions in their circles in order to encourage the stall-feeding of cattle by the local agricultural population. The result of these experiments are given in Chief Conservator's letter No. C-87, dated the 14th January 1914. He wrote as follows:—

"Since 1910 endeavours have been made to induce agriculturists to resort to stall-feeding and to purchase baled grass pressed by the Forest Department, but practically no success has been attained and often the baled grass that has been stored has had to be written off in succeeding years, or disposed of at a loss."

In corroboration of his report, the Chief Conservator drew attention to previous correspondence or action in the matter. Thus, the Conservators' Conference of 1911 wrote:—"It does not appear that there is much chance of

inducing agriculturists to purchase baled grass except in years of short rainfall." The Board of Forestry, held at Dehra Dun in March 1913, definitely advocated a policy of "cheap grass and dear grazing" and pointed out that the villager is not likely to take generally to stall-feeding until higher graizng fees are imposed.

The following details regarding grass baling operations in various forest divisions during the year 1912-13 will indicate the lack of success attained by these experiments (*vide* Report on Forest Administration for 1912-13, paragraphs 200—204).

Damoh.—195 bales, average weight 2½ maunds, of selected grass were prepared. To encourage sales, 59 bales were despatched to various important villages, but though the grass had been specially selected by the Deputy Director of Agriculture and was offered at cost price, *viz.*, Re. 0-8-3, only 9 bales could be sold. 71 tons in all were baled; of this quantity, only 4½ tons were sold to agriculturists and 62½ tons to other purchasers. The total cost of the operations was Rs. 595, and the resulting revenue, Rs. 635, making no allowance for cost of establishment.

Saugor.—403 bales, average weight 1½ maunds, were prepared and offered for sale at 12 annas per bale, being widely advertised by the Deputy Commissioner through the Revenue Staff. By the end of June, only 153 bales had been sold although the price was lowered to 9 annas, and subsequently to 6 annas per bale. 250 bales remained unsold and had to be written off. Of 22 tons cut and baled, only 2 tons were sold to agriculturists and 5 tons to other purchasers.

Hoshangabad.—581 bales were prepared at a cost of Rs. 519, but only 189 bales were sold, resulting in a revenue of Rs. 271.

Similar losses were incurred in Nimar, Akola and elsewhere, but the results in North-Chanda, Nagpur-Wardha and Yeotmal were more promising, though the largest sales were made in the towns and not to agriculturists. In the Berar Circle it was reported that "In no district there appears any great keenness on the part of agriculturists to obtain baled grass for stall-feeding".

Until such time as the agriculturist can be educated to see the advantages of stall-feeding over grazing it is not possible for the Forest Department to do more than it has done.

4. *The sale of fodder and thatching grass from closed coupes.*—By the sale of grass in closed coupes and in grass *birs*, the Forest Department does all in its power to encourage stall-feeding and thus to diminish the damage done to the forest by the grazing of excessive herds of cattle. Unfortunately, except in a few districts of the Province, *e.g.*, Nimar, stall-feeding is little practised with the result that in most Divisions the sale of fodder grass is very small. On the other hand, there is a heavy demand for thatching grass which is mostly cut and removed after it has become unfit for fodder. To try and stimulate the demand for fodder grass the Forest Department charges lower rates for grass cut up to the end of December, but this concession has little or no effect on sales of fodder grass.

Recently Government had under consideration the agency for the sale of grass in closed coupes. It was feared that the sale of grass *birs* to contractors might prove a hardship to purchasers who would have to pay contractors for cutting the grass and in addition would pay the contractor's profit. Investigations, however, proved that in many areas the purchasers prefer to buy grass ready cut by contractors even in Divisions where equally conveniently situated coupes are set apart for the sale of grass at lower rates on the license system. In some Divisions, on the other hand, purchasers prefer to cut the grass themselves.

As a result of these investigations, the Local Government decided that no hard and fast rules could be laid down for the Province as a whole for the agency to be adopted for the disposal of grass in *birs* or closed coupes so as to ensure the supply of cheap grass to cultivators. Accordingly, it has been decided to permit the use of both the license and the auction systems. The Divisional Forest Officer discusses with the Deputy Commissioner the arrangements proposed before grass in closed coupes is auctioned, the general wishes of the local population being duly considered.

5. *Methods for the supply of fuel and other produce to cultivators. Nistar and Paidawar.*—Certain prescribed villages, usually such as form enclaves within Government forest or are situated in districts where the demand on the forests is almost wholly confined to the demands of the village, are permitted to commute for *Nistar* and *Paidawar*; by commutation is meant the payment of a fixed sum every year by each household in the village for the privilege of removing from the forest, at any time during the year and as often as is necessary, certain stated description of produce for *bona fide* home consumption and not for barter or sale or wasteful use. The commutation system is only suitable where there is little commercial demand for forest produce; elsewhere, such a system is liable to abuse.

Nistar is usually taken to include dry fuel, bamboos, grass, thorns, leaves and fibres, while *Paidawar* means all edible roots, fruits, flowers and gums.

The more useful method of sale of these products to cultivators is by the license system, *i.e.*, a license is purchased from a license vendor which entitles the purchaser to remove the specified produce from the forest. Special low rates are fixed for each district for such produce as is taken by *bona fide* agriculturist. Dry firewood is generally taken from any area most suitable to the purchaser, while timber and larger quantities of fuel are purchased at somewhat higher rates in the annual coupes under working. These annual coupes are distributed according to the prescriptions of a working plan in such a way as to supply, as conveniently as possible, the local demand in every agricultural area adjoining the forest. These coupes are usually auctioned to contractors who fell the produce and sell to purchasers, but the system of departmental working of coupes is now becoming more widely adopted. Such a system ensures the proper sylvicultural working of coupes, it gives a larger revenue to the Forest Department by eliminating the middle-man's profits and by decreasing the possibility of illicit fellings, and it provides a salutary check on the rates at which produce is sold to cultivators.

In the Chhattisgarh plain, attempts have been made by the Forest Department to encourage the use of firewood as fuel as opposed to cowdung by the establishment of fuel depôts at suitable agricultural centres. The experiment has unfortunately not proved a success and it has been found necessary to shut down two out of four depôts after incurring a heavy loss. The resolution of Government on the Forest Administration Report for 1918-19 may be quoted in this connection—

"It must be admitted that the results so far have not been encouraging, and they afford a curious comment on the allegation sometimes made that the burning of cowdung as fuel is entirely necessitated by the lack of firewood. If the people of the Raipur district continue to burn cowdung, with 160,000 cubic feet of firewood stacked almost at their doors and offered to them at very cheap rates, immemorial custom and a preference for cowdung fuel must be assigned as the reasons for the continuance of the practice, rather than the scarcity of wood fuel."

The value of free grant of major produce in 1924-25 amounted to Rs. 52,834 and of minor produce to Rs. 1,63,915. In case of famine or scarcity, special free grants of grass, edible products, bamboos, etc., are made and payment of the usual grazing fees either postponed or entirely remitted.

6. *Extraction of minor forest produce, lac, etc.*—It is the policy of the Forest Department to carry out the propagation and cultivation of lac within Government forest as a purely departmental operation, employing labour chiefly of forest villages, to carry out the work. The Forest Department is always ready to purchase brood lac from cultivators at suitable rates and to encourage them in this way to propagate lac, but it is no longer the policy of the Forest Department to form out lac trees to contractors or to permit outside cultivators to grow lac in Government forest, results in the past having nearly always been unsatisfactory.

During the open season, when agricultural work is more or less at a standstill, many cultivators find suitable employment in the forest in collecting *harra, mohwa* or *tendu* leaves; similarly, in famine years, the various fruits and flowers of the forest, such as *tendu, mohwa* and *achar*, afford valuable means of sustenance to the local population.

7. *The construction of roads and wells, etc.*—The progressive policy adopted by the Forest Department in the construction of forest roads is sufficiently illustrated by the following figures :—

Expenditure on the construction of new forest roads.

Year.	Mileage.	Cost.	*Loan Fund Roads.*	
		Rs.		
1915-16 ...	244	17,499		
1916-17 ...	175	49,033	Mileage.	Cost in rupees.
1917-18 ...	212	48,410		
1918-19 ...	170	63,869		
1919-20 ...	163	65,948		
1920-21 ...	236	73,429		
1921-22 ...	445	19,538		
1922-23 ...	142	46,825	38	17,658
1923-24 ...	166	50,777	126	37,078
1924-25 ...	193	38,811	41	26,608

The construction of forest roads, while enhancing forest revenues, at the same time affords continually increasing facilities to the agricultural population for the removal of produce from the forest. Many of the roads, too, are not merely useful for the exploitation of forest produce, but by improving the general system of communications in a district they prove of inestimable benefit to the local population for the carting of their agricultural produce. Many agricultural areas which were previously remote and of low rentable value have become far more accessible and prosperous entirely through the activities of the Forest Department in the construction of new roads and it has frequently been suggested that the policy of debiting entirely to forest funds the expenditure on many forest roads which are equally useful to the general public for the exploitation of agricultural produce is a policy which might equitably be revised. The Divisional Forest Officer is very often more intimately acquainted than any one else with the needs of the agricultural population adjoining his tract of forest in the matter of road construction and it has been very wisely advocated that the Deputy Commissioner should consult the forest officer regarding the general policy of road development to be adopted in such tracts.

It may be added that local labour obtains abundant employment in the construction of forest roads, more especially in famine years when a special Famine Road Programme is brought into operation.

The repair and construction of wells, tanks and anicuts along forest roads or in grazing areas are works of public utility and add to the comfort of grazing cattle and of travellers. There are many roads by which it would be impossible to travel in the hot season, but for the provision of wells by the Forest Department, the expenditure incurred under this head in 1924-25 was Rs. 25,854, a considerable increase over previous years.

8. *Forest areas available for cultivation.*—When the forests were first reserved, many areas, particularly on the outskirts of the forest, were included, which were subsequently found to be more suitable for cultivation. Many such areas have since been excised from Government forest and formed into ryotwari villages; but this process has now probably reached completion and few, if any, areas remain for excision. Culturable areas within Government forest are now usually formed into forest villages with the object of increasing the supply of labour available for forest operations.

Replies to the Questionnaire.

QUESTION 19.—FORESTS.—(*a*) The forests of the Central Provinces and Berar are being worked primarily for the benefit of the agricultural population. The manner in which this is done is clearly explained in paragraph 1 of my note on "The Relations of Forestry to Agriculture" (page 271 above).

The needs of agriculture are put first, and when necessary forest land is given up for agriculture.

The following figures show the extent to which during the last twenty years the forest area has been reduced for purposes of cultivation :—

	Total forest area.	Loss in forest area.
	Sq. miles.	Sq. miles.
1906-07	22,002	...
1916-17	19,672	2,330
1925-26	19,503	169
Total ...	...	2,499

Every effort is made to give the agriculturist all the grazing he requires. It must be admitted that this is the most difficult problem in the Central Provinces as regards forest conservancy. The tendency is to demand more and more grazing at the expense of the forests, while the Forest Department has to see that the facilities afforded are compatible with the proper preservation of the forest. It is difficult to prove to those interested that a certain area is being overgrazed. It is more apparent to the eye of the trained forester than it is to the outsider. The opinion I hold is that consistent with the proper preservation of the forests, the agriculturist is being given the maximum grazing facilities that can be made available. The following figures give some idea of the total facilities for grazing, but it should be pointed out that generalisations from the totals are not altogether justified, because there are certain areas which owing to remoteness from cultivated areas are hardly grazed at all, whereas on other areas the grazing demand is excessive. There is an economic limit beyond which cattle cannot go for grazing.

Areas open to grazing.

	Sq. miles.
1916-17 ...	16,155
1925-26 ...	16,347

Number of cattle grazed.

1916-17 ...	3,581,780
1925-26 ...	3,526,621

With these figures may be compared the grazing facilities afforded in Bombay and Madras Presidencies.

	Forest area. Sq. miles.	No. of cattle grazed.
Bombay ...	14,970	2,438,889
Madras ...	19,128	2,235,069

The remedy for excessive grazing is of course stall-feeding. The cutting of grass and supply of fodder in place of grazing is the only possible and correct remedy.

Reference may be made to paragraph 3 of my note which gives full details of the attempts made by Government to provide cheap fodder and the small response made by the agriculturist. What I should like to see is a policy of dear grazing and cheap fodder. The present system of cheap grazing is not in the true interests of the agriculturist because he thereby keeps old and useless cattle which eat up the grass which should be reserved for the good cattle. It

should further be noted that the average annual value of grazing concessions in the Central Provinces for the last five years has amounted to Rs. 10,74,500. Paragraph 2 of my note deals with the actual rates charged for grazing.

(*b*) There is in my opinion no scarcity of firewood or fodder except in Berar. Paragraph 5 my of note fully explains the facilities for the supply of firewood. Special note should be made of the attempts to get the inhabitants of the Chhattisgarh plains to use fuel instead of cowdung for cooking, etc., and the comment of the Local Administration in the Annual Report for 1918-19. These facts speak for themselves.

In Berar the best method of increasing the supply of fuel would be to increase the areas of *babul bans* worked by the Forest Department under an agri-sylvicultural system. The demand for cultivation, however, is so great that the tendency is rather to reduce these areas and put them under permanent cultivation.

As regards fodder, enormous areas go to waste each year in the forests in those areas closed to grazing for sylvicultural reasons, usually after felling. Grass is available at cheap rates from these areas, but with certain notable exceptions it is not much sought after. Reference may be made to paragraph 3 of my note on "Experiments in the supply of baled grass for stall-feeding" in this respect.

A very notable exception is the district of Nimar where fodder grass is extensively cut and removed from Government forest for stall-feeding.

Incidentally the Nimar cattle are amongst the best in the Province.

(*c*) So far it cannot be said that forests in the Central Provinces have deteriorated to such an extent as to lead to soil erosion of a serious nature. Drought has had more to do with forest deterioration than anything else.

Overgrazing in some areas has resulted in deterioration of forest, but so long as Government realise the necessity of control of grazing and that there is a limit beyond which we cannot safely go without endangering the existence of the forest, I do not anticipate any serious damage.

I do not consider that floods that have occurred in the Central Provinces have been due to deterioration of forests. They have been due to unprecedented falls of rain against which no precautions were possible.

(*d*) The proportion of forest area to culturable area in the Central Provinces is ample and afforestation is not called for.

As indicated under (*c*), soil erosion is not a calamity in the Central Provinces.

A rule exists and has existed for years forbidding the felling of trees within 20 yards of either bank of a stream which ordinarily retains water until January in all malguzari areas. This rule aids in preventing destruction by erosion of agricultural land.

(*e*) Only as regards *babul bans* in Berar.

(*f*) The Central Provinces forests as a whole cannot be said to be suffering from excessive grazing. There are, however, certain tracts, *e.g.*, in Nagpur, Wardha and Yeotmal, where pressure of grazing is very severe. In such cases grazing settlements limiting the number of cattle that may be admitted have been made. In the Northern Forest Divisions of the Provinces no such settlements have been made. They are now needed and are being taken in hand with the preparation of new working plans.

The problem in the Central Provinces is to effect a more equable distribution of the grazing pressure over the available pasture grounds.

Soil erosion is undoubtedly facilitated by excessive grazing, but so long as the grazing is controlled and kept within limits, permanent deterioration of the forests can be avoided. The remedies for excessive grazing in the Central Provinces are—

(1) Grazing settlements limiting the total amount of grazing and aiming at better distribution.

(2) Higher grazing rates which would cause the agriculturist to keep less useless cattle and incidentally benefit the better cattle.

(3) Low rates for fodder grass (already in force) which combined with high grazing rates would induce the people to go in for stall-feeding.

Oral Evidence.

30170. *The Chairman:* Mr. Witt, you are Chief Conservator of Forests in the Central Provinces?—Yes.

30171. We have the notes of the evidence which you wish to give. Would you like to make any general statement at this stage?—No.

30172. You have given us a very complete note of the fashion in which you attempt to reconcile the sometimes conflicting interests of forestry and agriculture and I have only one or two questions to ask you. Have you any shifting cultivation in the Province?—Very little; it is so small that it is quite negligible. We used to have it but it has gradually been stopped.

30173. If the policy of cutting and preserving fodder on a large scale in the forest areas is to be undertaken, would you suggest that the Forest Department should do it or the Agricultural Department?—I think the Forest Department could do it. We carried out very big fodder operations during the War.

30174. Could you carry that out with the present staff?—No, we should probably have to take on certain additional staff if it is to be a regular thing. We have got very good centres for it and it was even under consideration whether we should not have permanent steam baling presses in the Nimar district south of Khandwa, which is the best centre for it. That project was finally abandoned because we found that, except in really serious famine years, there was no sufficient demand. We have tried at different times to adopt this baling and supply of fodder but it has never given us any results worth having at all.

30175. Has it been regarded as a form of insurance against a fodder famine?—Yes, I should say it has. I know it has been suggested that funds should be put at our disposal for these purposes. That has not been done but, as occasion arose, we have been asked to carry out certain works. Last year we were suddenly asked to supply Berar and the orders went backwards and forwards. It was first wanted, then it was not wanted, and again it was wanted, and finally we prepared this grass and in the end Berar did not take it and we had to sell it locally.

30176. At a loss?—It just about covered the expenses.

30177. As a reasonable scheme do you not think that two years' hay should be kept in storage and that all the hay should be sold in the third year for what it would fetch?—The trouble would be to store the fodder. We should require very excellent and expensive sheds in which to preserve it and we should have to see that it was stacked carefully. All that would make it very costly.

30178. You think that you could not undertake to keep it more than one year?—No.

30179. By what period in the year does it become evident that there is going to be a fodder famine?—You can usually tell by about October or November, but not before. Then of course that is just about the latest time for them to start cutting their grass.

30180. The very latest?—Yes.

30181. So that you cannot wait until you have a warning before you make your hay?—No.

30182. Meantime, is there no fodder reserve at all in your hands?—Cut and baled?

30183. Yes?—Not cut and baled. We do not keep any in stock.

30184. It is your view, I understand from your note, that, consistent with the reasonable requirements of sylviculture, you are giving the cultivators all that you can in the direction of facilities for grazing and grass cutting?—Yes.

30185. How about fuel?—I prepared a small note on that, especially on the supply of fuel where people largely use cowdung. We tried it a year or two ago in Raipur; we took 27,000 maunds of fuel out 20 miles from the forest and dumped it right in the middle of the plain.

30186. And in the middle of the villages?—Yes; that was in 1920. By the end of 1924 had only sold 18,000 maunds which realised an average rate of 4 annas a maund. There was a tremendous lot of wastage and in the end we lost Rs. 4,040 on the transaction.

30187. Do you consider the price at which you supplied this fuel to be reasonable?—It is reasonable that they should pay a little higher price for fuel which we had carted such a long distance. Some of them prefer to fetch it from the jungle themselves.

30188. Is it true that you, in attempting an experiment of that sort, are in conflict with habit as much as you are in conflict with the economics of the situation?—Yes, I quite agree. I put it down more to the difficulty of overcoming the habit of using cowdung than to anything else.

30189. So that both propaganda and patience are necessary?—Yes.

30190. Was the experiment repeated?—We closed this depôt down altogether because there was a certain loss.

30191. Was there any propaganda either by your own department or by the Department of Agriculture?—Not that I know of, except that we advertised it. The people round about knew that we were doing it; there was no special propaganda work.

30192. Probably a little more persistence and propaganda would be required to make it a success?—Yes, I think we should be prepared to lose money on it for several years to come.

30193. I understand from your note that you do your best to provide fuel for those cultivators who are prepared to carry it themselves?—Yes, we have not only a system of daily licenses, but where there are big centres and forests, we have a monthly ticket and the men can go in every day and pick up dry fuel.

30194. What does it cost them?—Very little, I think. I am afraid I have not got the figures with me, but I do not think that it is much more than a rupee per month; that means head-loads only.

30195. Have you different licences for larger loads?—Yes, different rates for head-loads, cattle-loads, and cart-loads. The average price of a head load is about 6 pies.

30196. Do you think it would be to the advantage of the cultivator to lower the rates for grazing?—I suppose it would be a great advantage to him if he could get his grazing for nothing.

30197. It would be attractive to the cultivator, but do you not think it might encourage him to keep a greater number of inefficient cattle?—I am sure it would.

30198. And to that extent probably a reasonable charge is, in the long run, in the interests of the cultivator?—Yes; as a matter of fact we feel our grazing rates are unreasonably low.

30199. What are the rules about goats grazing in the forests?—We do not allow any goats or sheep in any "A" class reserve. Our forests are divided into "A" class and "B" class reserves. "A" class forests are forests which we imagine will always be retained as forests. The forests classified as 'B" class are those which are set aside for eventual cultivation. When there is a demand then lands are taken up for ryotwari cultivation. In "B" class forests we allow goats and sheep, but not in "A" class forests.

30200. Have you any panchayat-controlled forests in this Province?—No.

30201. Are you familiar with the experiments which have been made in certain other Provinces?—No, I have not come in contact with them.

30202. Does work in the forest provide the forest tribes engaged principally upon cultivation with a certain amount of spare-time occupation?—Yes; we get a very large proportion of our labour from our so-called forest villages. We have villages in our forest reserves where we allow these people to settle and that is our mainstay for labour.

30203. You give these people a certain amount of land for cultivation?—Yes, we allow them certain concessions such as free grazing and we supply them with fuel and small timber.

30204. Do you give the land to them in ryotwari rights?—No; a forest villager is a tenant-at-will with us. If he does not abide by the rules framed for him we can turn him out at once.

30205. So that he is really there as a forester encouraged to build his house and he is given certain privileges in the way of cultivating a small piece of land, but he is really kept there for supplying labour to the Forest Department?—Yes; we do not like them to have too much land. The average amount of land we give each man is 10 to 20 acres. We call it a plough or two ploughs of land.

30206. Have you calculated at all how much time they can give you if they cultivate 10 acres and do it properly?—No; we have not made any calculation in that way; but we find that in most villages we get all the labour we require.

30207. It looks as though a man cultivating 10 acres has a considerable amount of spare time on his hands?—Yes.

30208. Is land reasonably well cultivated in the forest villages?—Some of it is very poorly cultivated.

30209. Is it all dry cultivation?—Yes.

30210 Do you not encourage the *bunding* of a stream or anything like that?—I do not think we have got anything of that sort. In a few places where there is rice cultivation they may have a small village tank which they make use of but there is practically no irrigation cultivation at all.

30211. Are you satisfied that there is sufficiently complete touch between your department and the Agricultural Department?—Yes, I should say so, distinctly.

30212. How often do you meet the Director of Agriculture?—There is no special time for it, but whenever any special problems come up we communicate with each other. For instance, we discuss cattle farms and things like that.

30213. Is it your view that something more should be done to instruct the junior members of your service in the agricultural aspects of forestry? Does it occur to you, for instance, that a short period of attachment to the Agricultural Department in suitable districts might be very helpful?—No, I have not thought of it. I think every forest officer's training takes in very much the point of view that the first thing he has to see is the connection of the forest with the local people; that is one of the first things they are taught: that we have not merely to make a commercial success of it, but we have got to supply the requirements of the people first and at the same time of course preserve the forests. When forest officials are trained, this question is always taken up very considerably.

30214. Possibly that particular aspect of the matter is a tradition in this Province?—I think so. The requirements of the people is the first consideration.

30215. Do you often hear complaints from the cultivators?—The only complaint we hear is that there is never enough grazing, that is all.

30216. Are you controlling the lac industry in this Province? We have a lac industry in this Province, particularly in two Divisions.

30217. You have given us a note on the point. What exactly are the conditions under which this industry is carried on? Is it a village industry proper?—No, it is more from the forests.

30218. But it is carried on by the villagers independently, is it not?—To a certain extent, but nothing like the extent to which it is done in Bihar and Orissa. I have been there and I found the lac industry in villages was really a very big thing. Here it has been taken up a bit more during the high prices of lac by villagers and there are great possibilities in it, especially in the so-called *palas* lac which is in large quantitites in village areas. I think they could do a great deal more in that respect than they do at present.

30219. You say that the policy of the Forest Department is to carry out the propagation and cultivation of lac within Government forests as a purely departmental operation, employing labour chiefly of forest villages to carry out the work. You do not think that it can be done by private enterprise?—Yes it used to be done. We used to give contracts for the propagation of lac, but it was very unsatisfactory. It was done most unscientifically. Since we have learned something more about it, we have taken it up departmentally, and we carry it out ourselves with better results.

30220. So that the whole industry is now carried on departmentally?—Yes, but only in the Government forests.

30221. Then who is in charge of the lac industry in forests other than Government forests?—That is entirely in the hands of the malguzars or the headmen of the villages.

30222. I saw the lac factory at Rewa. I was told that the Rewa lac was sold at a premium. Is there any reason why the lac of the Central Provinces should not fetch as good a price as the Rewa lac?—No, none that I know.

30223. Does it?—We find that our prices entirely depend on Calcutta prices; we can fairly well gauge at what rate we can sell our lac according to the Calcutta prices at the time.

30224. But Rewa lac apparently gets the market price *plus* a premium?—We have no factories; all ours is sold by auction to contractors who export it mostly to Calcutta.

30225. Then it is a fact that villagers carrying on lac industries in the forests other than in the Government forests are not being watched or encouraged by any department?—No.

30226. Is there any sericulture in the Province?—Nothing worth speaking of. There used to be a little in Chanda; in our forests there small areas used to be taken up, but the revenue from it is absolutely negligible.

30227. Is it capable of development, do you think?—I suppose it is to a certain extent, but I really do not know very much about it.

30228. Do you know which department is responsible for sericulture in this Province?—No. I know we lease out small areas in places like Chanda, but I should think the Department of Industries is responsible.

30229. Does the local worm feed on mulberries?—No, we have not got that kind. It is a different kind; it feeds on the tree *terminalia tomentosa*. In the "B" class forests we lease out areas of from 5 to 10 acres. They are allowed in those areas to lop the branches, and so on. We would not allow it in "A" class forests.

30230. Would it do any harm in the "A" class forests?—It would be very difficult to control this lopping and hacking of the trees. It does not matter in "B" class which is ultimately going under cultivation. They would lop the branches, take the leaves, etc.

30231. *Sir Henry Lawrence*: Do you get *terminalia tomentosa* growing together in large areas?—It is mixed, but you do get areas where there is a sufficient quantity of this kind of tree to enable them to deal with it.

30232. On page 274 of these notes you mention that you closed down the experiment of selling fuel owing to the loss. I think I understood you to say that the loss was Rs. 4,000 over four years?—Yes.

30233. Is that the total loss that you suffered from this experiment?—Yes, Rs. 4,400. The total expenditure was Rs. 8,400; the total Revenue was Rs. 3,990; the loss to Government was Rs. 4,410, and all the fuel had gone of course.

30234. You speak in your note of incurring a heavy loss. Would that loss be Rs. 1,000 a year over a period of four years, or something more?—That would be Rs. 1,000 a year.

30235. It is not a very big sum to spend in introducing a new custom amongst an illiterate population?—No, I agree it is not very much.

30236. It might be worth while to continue the experiment for a longer period at a somewhat heavier public expenditure, might it not?—Yes, I think there is a good deal to be said for that. Unfortunately the Forest Department is expected to produce a higher revenue and in the anxiety to produce a higher revenue we rather try to cut our losses.

30237. Actually you make a revenue for the State of 20 lakhs of rupees or more net every year, do you not?—Yes, something like that has been the average for the last few years.

30238. I find also 30 or 35 lakhs of rupees revenue; is that the normal figure?—No, 20 lakhs has been the highest surplus. As far back as 1915-16 it was 15 lakhs;

in the succeeding years it was 16, 16, 14; 21 lakhs in 1919-20; then 16, 14, 16½, 20, 20 and now in 1925-26 we are not so well off because it is a poor agricultural year and that immediately affects our revenue. Our biggest supplies are our local supplies, and as soon as you get bad cotton or other crops the revenue suffers.

30239. Then from your point of view it would be quite reasonable to allow you to have a larger expenditure and not press you to produce a larger surplus?—I certainly think so. The Central Provinces now comes fourth in the list of net revenue in the whole of India. Only Burma, the United Provinces and Bombay produce higher revenues. When we produce 20 lakhs surplus, a huge Province like Madras produces only five lakhs surplus.

30240. Then you think you should be allowed a freer hand to spend money on useful projects?—Yes, I am prepared to say that.

30241. You have three grazing rates: the privilege rate from 1 to 2 annas the ordinary rate three or four times that, and then the commercial rate. What is your commercial rate?—The commercial rate is almost entirely made use of for buffaloes which are kept by certain classes of people in considerable numbers for the supply of *ghi*.

30242. What is the amount of it?—A good buffalo, I should think, can return to the owner in a year at least Rs. 100 net.

30243. I ask what is the amount of the rate you charge for such grazing?—From Re. 1 to Rs. 2 a year.

30244. A good many years ago the Forestry Board decided that the policy as to forests should be cheap fodder and dear grazing?—Yes.

30245. Do you think you have arrived at that in the Central Provinces?—No, I do not think so.

30246. Do you think it is the best policy in the interests of the country?—I think it is. I am sure it will lead to less of these useless cattle being kept

30247. How do you hope to arrive at this ideal policy?—We should have to put up the grazing rates in the first instance. We have quite a big supply of fodder; a large amount of grass goes to waste every year. We have large supplies of fodder owing to areas that were closed to grazing, after working over, being available for cutting and removal of grass; those areas are either sold to contractors or opened to cutting by the people. The question came up a little while ago; there were complaints that the contractors who bought these grass *birs* by auction sold grass at rates which were too high. What we found was that in many cases people preferred to come to the area, find grass there cut and stacked, pay a little more and take it away. In other places they preferred to go themselves, cut the grass and take it away. We usually sell these grass *birs* about August when it is more or less known what the state of the grazing is going to be. The Forest Divisional Officer is supposed to consult the Deputy Commissioner as to which areas should be opened for cutting by license, that is to say, that the cultivator should go in himself and take it, and which areas we could reasonably put up to auction for a contractor to buy and do the cutting and selling himself. The cultivators are given every opportunity to decide whether they would like to cut it themselves or whether they would like to have it done by contractors. Our general experience is that they prefer the contractor, because he gets in his labour, cuts and stacks the stuff, and they find the stacks waiting for them. In areas where they can cut for themselves, they always come so late that it is no good; their agricultural work will not let them come sooner, and that is the case in the whole of the Province except in one district. In Khandwa, in the Nimar district, where I was 20 years ago, all the cultivators used to come in in October and November and cut their grass (we allowed them to do that), and they stacked it there until they were ready to take it out when they had more time, in December or January or later, and there they have got some of the finest cattle in the Province.

30248. Do you think there will be much opposition to any progress in this direction of cheap fodder and dear grazing?—I am afraid there will be.

30249. Is any propaganda being attempted to teach the people that this is the right policy?—Not more than by offering them the areas, so that they can come in and cut the grass; we have not advertised the fact very largely.

30250. Are changes in your grazing rates subjected to the vote of the Legislative Council? Does it come before them in any form at all?—No. I think not; the Forest Department have been urging Government to raise the rates for grazing, but the Council refused to take it up. It is one of the most difficult things to do, it would lead to agitation at once. The members continue to bring forward questions as to why there is not more grazing.

30251. The Council do not appreciate the problem of how far that is possible?—Not at all.

30252. And something ought to be done to instruct them?—Yes.

30253. *Sir Ganga Ram*: What kind of trees have you in your forests?—The two main trees in the Central Provinces are the teak tree which supplies all the timber for constructional purposes and the *sal* tree which supplies all the sleepers to the railways.

30254. Have you any works here to supply sleepers?—In the last two years, we have started large departmental operations for *sal* sleeper supply to the railway; we have now built a tramway in Raipur 60 miles long, which taps these *sal* forests and we shall now be able to bring out larger quantities at cheaper rates to Raipur.

30255. When you say tramway, you mean a light railway?—Yes.

30256. How is it worked; by horses?—It is a steam tramway.

30257. What gauge?—It is 2 ft. gauge.

30258. When you say that you are making Rs. 20 lakhs a year, is that from old forests or from such forests as you have grown in your time?—It is entirely self-grown forests.

30259. How much revenue do you get from those which are grown through the exertions of the Forest Department?—We do not depend on plantation forests; they are of what we call natural generation. We depend on the seed which falls to the ground; we do carry out certain operations which assist the seedling in getting a hold of the ground and coming up, and not being crowded out by more inferior trees. We have a few plantations in the Province, but it is nothing very much.

30260. If you allowed cultivators to cut and take away the grass in your 'A' class forests, would it matter very much?—We should be only too pleased if they were to do so; the grass interferes very much with the seedlings.

30261. Have you given them the opportunity?—We always make that offer.

30262. They will not take it?—In a few places they take it, but there are very large areas untouched every year; in many of those places we burn the grass to get rid of it.

30263. If you baled the grass departmentally and kept it, do you not think that you could sell it?—We have tried it in several cases, but we find that there is no demand for it.

30264. Are your forests situated in places where railway facilities exist?—In the Nimar district, there is a place called Mandwa; that is the place where we had the largest operations during the War for fodder. We had the grass cut and baled and put on the railway there, ready to send it to Berar but at the last minute they said they did not want it; they said that the Nimar grass was no good, and we finally sold it locally.

30265. What did you tie these bales with?—With wires; that was hand-baled grass.

30266. How many bales could be put into a railway wagon?—Of course, with hand-baled grass you cannot get a large quantity in a wagon.

30267. What was the cost per bale?—There are some figures on page 274 of my note, for Damoh and Saugor. The bales were 2½ maunds for Damoh and 1¾ maunds for Saugor, and we offered them at 12 annas; we reduced the rate to 9 annas and subsequently to 6 annas.

30268. What is the cost of baling only?—I do not think I have got the figures for that.

30269. Can you give a very big supply of sleepers to the railways, as much as they demand, or do they have to import from the Punjab and other places?—We do not supply everything, but there are large State forests which supply sleepers in the Central Provinces.

30270. Can you supply their full demand, or is the demand met by importing from outside places?—The demand is much greater than we can supply.

30271. You could not widen your operations so as to meet the full demand?—Not without encroaching on the Working Plans of the forest. We have got a Working Plan which allows us to cut so much a year, and unless we encroach on that we could not do it. Even if we encroach on the Working Plans, we could never supply the full demand for sleepers by the railways.

30272. What kind of tree have you found most suitable for lac cultivation?—There are two kinds of trees; the best lac comes from the *kusum* tree; it is a large tree which grows mostly in Raipur, and the lac from Raipur, which is a big centre for lac culture, is from the *kusum* tree. The other trees are the *palas* tree and the *ghont* tree; the biggest centre for that is Damoh. The value of *kusum* lac is very much higher than that of the other lacs; its value is nearly double; it gives a much clearer yellow stick, or shellac, than the others.

30273. Have you any means of starting turpentine factories?—No, we have no pine trees in the Central Provinces.

30274. You have not got trees which give resin?—There are no trees in the Central Provinces that can give turpentine.

30275. Do you give facilities to the people to collect leaves and cowdung for use as manure?—Yes, cowdung is taken away from our forests when we have these *gwaris* in the forest. In the rains people send cattle in large herds to suitable areas where we allow them to graze and of course they are kept in the forest at night. There are big stands for the cattle.

30276. Is it collected as manure for cultivation?—Manure is collected there and sold afterwards.

30277. Do they do that in villages which are surrounded by forests?—They will not go round just to pick up a little cowdung here and there.

30278. They ought to have a great supply of manure?—They have what they collect in their own villages from the cattle stands.

30279. You do not object to their removing these materials from your forests generally?—Not at all.

30280. There is no tea cultivation here?—No.

30281. Not even near Pachmarhi?—No.

30282. *Sir Thomas Middleton.*: You referred to the method of supplying fuel in the Berars by the formation of *babul bans* in that area; what is the usual size of the *bans* which you work?—They are very small areas; they may be anything from 5 to 10 acres or 15 acres sometimes, most of them are very small.

30283. Are the *babul bans* that the Forest Department have in their charge widely distributed or are they congregated in certain tracts?—They are rather confined to three or four Divisions of the Berars. Where they exist, a good many of them are fairly well distributed.

30284. Have the villagers in the other districts of the Berars shown any desire to secure these *bans*?—Certainly, for cultivation; they would like them for cultivation, but it supplies so much fuel in a country where, if they did not get it there, they would have to go very much further, that I think it would be a great mistake to give them over for cultivation. I am prepared to admit that *babul ban* areas are equally good for cultivation, but as they now are they supply not only fuel, but they give cultivation and grazing. The system of producing these *bans* is to sow them up with a crop. We

lease out the area up to about seven years and with their crops they have to put in the seeds of the *babul*; they have to look after them and see that the land is weeded properly, and they hand over to us, after seven years, this area with the *babul* trees in lines growing on it; so that they do get cultivation on it; then we allow grazing in between the lines; it does no harm to the *babul*, and at the end of twenty-five years you get the *babul* which gives the finest fuel and is sold at colossal prices.

30285. *Sir Ganga Ram*: What is a *babul ban*?—*Babul ban* is the name.

Mr. Kamat: A *ban* might be called a grove.

30286. *Sir Thomas Middleton*: Then I take it that these plantations are very popular in the districts in which they exist?—Yes, distinctly; I should say.

30287. What I want to get at is whether the other districts of Berar show a desire to have such plantations or whether there is no land available?—I do not suppose anybody would go in for it himself.

30288. Because in certain other Provinces where fuel has been scarce there have been attempts, as the Chairman has indicated, to form village plantations which have been assisted by the Forest Department?—I think that probably could be enquired into; there must be a certain proof of wastage; if it is really very good black cotton soil there is not likely to be much wastage.

30289. Apart from the *babul*, is there any other quick growing tree which would be likely to thrive in black cotton soil?—Nothing better than the *babul*.

30290. You refer to the difficulty of keeping hay in stack for more than a single year. Is material fit for thatching difficult to get in the forest area?—I did not mention that fact, but a large amount of grass is cut for thatching purposes. In some of the districts all the grass that is extracted is used for thatching purposes and not for fodder, especially in Chanda, Bhandara and other places.

30291. Are good thatchers difficult to find?—Yes; but the thatching of the hut of the cultivator is very simple.

30292. I was thinking of your hay stacks?—Yes; it is rather difficult to find good material for it. It will increase the cost afterwards unless Government is prepared to do it merely for a nominal sum.

30293. I think a well thatched stack would keep for at least two seasons?—The Military farms, I believe, do that; but then it is most beautifully and most elaborately stacked; most of the grass is steam-baled and they thatch absolutely down to the ground.

30294. You think that the cost of good thatching would make the system of preserving stacks for over two years impracticable?—I think we should in the end have to stack the hay under permanent corrugated iron covers or something of that sort.

30295. That would prove a very expensive matter?—Yes, very expensive.

30296. Have you ever made any attempts to make ensilage anywhere?—No; it has never been tried.

30297. You have indicated that the Nimar cultivators use your grass freely; to what distance does it travel from your forests?—Some of them come in from 20 miles to get fodder.

30298. What is the quantity of hay that you will get from an acre of good forest; how many maunds?—I would not like to say off hand.

30299. What I want to get at is some indication of the productivity of the land when it is closed?—Yes; I will send you that later on.*

30300. Can you tell us anything about the quality of the grass in the forets?—It is the commonest; it is not the best. The grass called *mushan* is one of the best (*Tseilma Laxum*). In Nimar there is a very good grass which is known as *ponia* or *sena* (*Tschœmum Sulcatum*). I am not sure about the names; but I have a book where all these names are given and I might send that book along.

* From the statistics collected in the Southern Circle (*i.e.*, about half the area of Central Provinces) it was calculated that 7½ acres of forest area yielded one ton of grass. These woeld be open forest areas or areas recently felled over.

30301. Perhaps you could give us the names and a rough indication of their relative importance, whether they cover a large area or whether they are only found in selected parts; that would be of some help?—Yes; I will let you know that.

30302. In regard to your grass land I see that you provide roughly about 3 acres for every animal you graze?—That is our idea; then we would not be over-taxing the forest.

30303. It must vary very widely in different districts of the Province?—It does, but the difficulty is that you have large areas or blocks of forest and the grazing on the edges is very heavy because they do not go in beyond a certain distance; in the centre there are certain untouched areas on which we are perfectly prepared to let them graze.

30304. Have you made any observations on the effect of differential grazing on the quality of the herbage?—Outside the forest the grazing is unequal.

30305. Have you noticed any difference?—No; I cannot say we have. I do not think the grazing of the cattle affects the quality of the grass; but what we did find was that when we tried burning over areas after we had cut them to see if we could not get rid of the dead grass the result was that we killed out a lot of the better species and the coarser species survived; we found that it was rather against us.

30306. Apart from the reserved areas, all the grass land of India suffers from over-grazing?—Yes.

30307. There is no chance for the better species to survive and what I wanted to get from you was whether, when protected in forest areas, you noted any difference in the quality of the herbage?—No; I cannot say I have.

30308. That probably has not been looked for?—No.

30309. Apart from your classification by privileged and normal rates, do you classify cattle in any way as between oxen and buffaloes?—Yes.

30310. What I want to get at is the corresponding rate for the cow and for the buffalo?—One buffalo does as much harm as two bullocks at least; the buffalo does a lot of damage by trampling and is very fond of rubbing itself against young saplings; it does much more damage in the forests.

30311. The buffalo will also want 1½ times or twice as much grass grazing?—Yes.

30312. *Dr. Hyder*: The policy which you have in the Central Provinces is dear grazing and cheap fodder. With regard to the first part of it, dear grazing, you certainly produce beneficial results, that is to say, you protect your forests and you diminish the number of old and useless cattle. What would be the probable result of this policy of cheap fodder? Do you think it would result in diminishing the number of inferior cattle?—I think fodder is offered at a cheap enough rate now.

30313. I am not concerned with the question of the amount or cheapness; I am concerned with the question in relation to the number of cattle. Do you think if you offer cheap fodder this policy would result in eliminating old and useless cattle?—I am afraid that it is a matter of custom with the people.

30314. If you want to keep the cattle population of this Province within manageable limits of course the first part of your policy is all right, but I do not know whether the same results would follow from the second portion of your policy, namely, cheap fodder?—If they can get fodder cheap enough I suppose they might say 'Why worry about getting rid of these poor cattle, if we can feed them so cheaply'?—That is the danger I suppose.

30315. Have you got enough light railways for the proper working of your forests, for making your forest produce available in agricultural area?—This is the first scheme we have attempted.

30316. Just near Muramasilli?—Yes, near about that place. That is the first one we have attempted and we have not got any further schemes. Others have been thought of but nothing has been considered good enough or likely to be paying enough to start with.

30317. You say in your note that your aim is to give the maximum grazing facilities that can be made available for pasture grounds. How do you propose to do that?—The only way one might do that is by putting high rates on the near areas and cheaper rates in areas a little further away.

30318. What is this difference of opinion that you have with the Settlement Department? You are comparing your grazing fees with the land revenue increases in the settlement?—Our point is that the land revenue settlements get put up but our grazing rates are practically the same to-day as they were fifteen or twenty years ago.

30319. Which would you prefer the contract systems or departmental working for the extraction of forest produce?—We are finding now that departmental working is much more profitable.

30320. And more satisfactory to the agriculturist?—Well, I think so, certainly where we have been trying to provide supplies of fuel. For instance in Raipur, it will really come in useful for bringing out fuel on the Raipur side, but that is more really a town business than one for the agriculturist. The average fuel supplies are done quite satisfactorily by the small contractor who takes a coupe and fells it. Most of our departmental work is now for big schemes like big timber and so on.

30321. Take this auction system: you interpose a middle man between the agriculturist and yourself?—Yes, but that only applies to green fuel. There are always supplies of dry fuel which are entirely disposed of by the license system, by the cultivator himself going in; the quantity of fuel that is taken out in every Division in the Province is very large under that head under the license system.

30322. Would you prefer the license system or departmental working?—I would not be in favour of departmental working for fuel.

30323. The extraction of lac is entirely departmental is it not?—Yes, so far as our forests go.

30324. What is your revenue from lac?—There are two big Divisions, Damoh and Raipur. Damoh a few years ago gave a revenue of about Rs. 3,00,000 in one year but unfortunately we have had bad crops and it has now gone down to about Rs. 50,000 this last year; in fact about Rs. 70,000 I should say.

30325. And the net financial result?—That is about the net financial result. It is a very difficult crop to deal with as you are absolutely at the mercy of the climate.

30326. Is the collection of *harra*, *mohwa* or *tendu* leaves free?—No.

30327. Do you charge anything for the extraction of tigers from those forests?—No; you have got to get a shooting permit to shoot in the forests and that costs nothing.

30328. *Sir Henry Lawrence*: What is your tiger population?—It is very large.

30329. Have you had a census taken?—No. We had over 50 tigers taken out of one big block of forest within two years by certain Maharajas who came to this Province some years ago.

30330. *Mr. Wills*: It is a fact, is it not, that the *babul ban* found in Berar serves a very useful purpose not merely for the production of timber but also for grazing purposes?—Yes; *babul* is used as timber wood for the construction of carts.

30331. Then as regards the relation of forestry to agriculture; what department of administration do you consider represents agriculture?—If any question comes up the first person to deal with it would be the Deputy Commissioner.

30332. That is the Revenue Department and not the Agricultural Department?—That is so.

30333. *The Raja of Parlakimedi*: For what purposes do you lease out open areas in the forests?—Only as forest villages and this is mainly for the purpose of supplying labour.

30334. And you have been allowing certain areas of forest for cultivation also?—That is absolutely negligible. There used to be in the old days quite a lot of shifting cultivation which has been gradually stopped, and what cultivation there is inside Government forests now is entirely confined to our forest villages.

30335. Is that on lease or is it permanent cultivation?—No; it is taken from year to year. We have very simple rules which have been framed by Government. Cultivators in forest villages do not come under the revenue rules at all.

30336. Do you restrict the expansion of the area?—Yes, it is laid out definitely. Supposing we make the village 500 acres in size, it is demarcated, and we only give

cut say a couple of hundred acres of that for cultivation to these people to begin with, leaving enough spare land for the natural expansion of the village. We want to keep them within our control for our labour purposes.

30337. You do not encourage the cultivation part of it ?—No; we just give them enough to carry on with. As a matter of fact, only certain special classes of people are supposed to come into these villages, such as Gonds, Korkus and other jungly tribes; we do not want highly educated cultivators.

30338. You do not allow them to carry on *faltu* cultivation ?—There is a small area called the Baiga chak in Mandla where this cultivation known as *bewar* goes on. But there is only a little of it left.

30339. It has not been entirely eradicated ?—No; it has been kept for the benefit of the Baigas within certain limits.

30340. You say that the public make use of your forest roads in certain parts. Can you not get some grant from any of the public bodies near by ?—When these roads were constructed the Government rule was that we could prohibit outsiders from using them as they were purely forest roads, but that they could be used provided the District Council gave us a grant towards their upkeep and maintenance. We applied to one or two District Councils and the reply was that they would be delighted to use the roads but they had no money to give. We have not received anything from them so far.

30341. And do you try to keep their carts off?—We have tried, but it is really more bother to us than it is worth, for it means keeping *chowkidars* and that sort of thing and causes general friction and probably squabbling and things of a similar nature.

30342. In the areas where coupe felling is going on, do you not allow grazing to go on also ?—Not after cutting.

30343. Your figures show that there has been a decrease in the area set apart for grazing. The figure for 1925-26 is less than the figure given in 1916-17 ?—There is some mistake here. The number of cattle is slightly less, due probably to cattle mortality, but the area open to grazing is 192 square miles more than in 1916-17.

30344. The decrease is not because of the restriction of land ?—No.

30345. *Prof. Gangulee:* Could you give the Commission an idea of the training which your subordinate officers receive ?—You mean the non-gazetted officers from the forest guards upwards.

30346. Yes?—The Forest Guard has no training whatsoever. We just pick him up locally and start him with a small salary, he has no training whatever. Then there is the Forester; he may start also without any training. We have had a little Forest School at Balaghat for the last 15 years. We train there occasionally the Forest Guards who have some education. They have to be able to read and write in the vernacular. These Foresters are given a training which enables us to promote them up to Deputy Rangers. They get from Rs. 40 to Rs. 60. Then comes the Ranger class; their pay is from Rs. 80 to Rs. 200; they are now trained at Coimbatore in Madras. The training of the Rangers used to be at Dehra Dun, and there is still a Rangers' course there; but the Central Provinces Government now send their men to Coimbatore. They have a two years' course there.

30347. In the school you refer to, is the teaching done in the vernacular? Yes: This is in Balaghat.

30348. Which officials come in direct contact with the agriculturists? I suppose the Forest Guard is the man who comes in most direct contact?—Right up to the Ranger.

30349. I understand that the contact of your department is more intimate with the Revenue Department than with the Agricultural Department; is that so ?—I suppose we do have more contact with the Revenue Department because the administration of the district is in the hands of the revenue authorities; and when there is any administrative question, a Forest Officer naturally goes to the Revenue Officer in charge. But as I have already said, we come in contact with the Agricultural Department more with regard to questions of fodder supplies, cattle farms, etc., that is to say, the bigger questions.

30350. Have you undertaken any survey of the various types of grasses in the forest areas of the Province?—I cannot say we have.

30351. Are you familiar with any research which has been done on the various kinds of grasses in the Province?—As to their value you mean.

30352. I mean with regard to their feeding value, growth, and quality in general?—I studied it a bit myself; I have written a small book on the grasses of the Central Provinces. As a matter of fact, somebody in the Agricultural Department took up the question of grasses and he also wrote something about it. Perhaps Mr. Plymen would be able to speak on it.

30353. You are not in touch with that work?—I cannot say we have done any research work of that kind. I think it was the Economic Botanist who took up this question in the Agricultural Department and studied it.

30354. Are you carrying on any investigation in the deterioration of the forest areas and the forest soils?—I cannot say we are really carrying on any investigation into the matter. Cases of that sort occasionlly come up. Now, during this process of making new Working Plans reports come in, but no regular investigation is being carried on into the matter, though we could put our finger on certain places and say that a particular area has distinctly deteriorated. I would not say that deterioration is going on to a very large extent, and I think we are keeping things sufficiently in hand to say that our forests are not being ruined; but I should not like to see the grazing go much further; if it did, I think damage might be done. If our hands were forced, then I think damage might be done. If we can keep things as they are now, we shall always have enough forest for the people.

30355. Have you any information as to the quality of the baled grass?—Provided the grass is cut early in the season, before the end of the year, the grass is all right. I prefer to see it cut in October and November.

30356. What is the cost of baling?—You mean hand baling.

30357. Yes, hand baling? I think that is the common practice here?—That would cost on the average Re. 1 per ton.

30358. What is your agency for distributing baled grass?—It is done through our staff. There again we should have to go to the Deputy Commissioner and tell him we have got this stuff in certain centres. His Tahsildars and other people would then let the villagers know that it was there. That would be the best agency to get it known.

30359. Is there any intermediary between the Forest Officer and the cultivator in the sale of the baled grass? Our Forest Rangers, Foresters and Forest Guards could all be intermediaries in the matter, but it would help a great deal more to go to the revenue authorities and get their assistance.

30360. There is no other foreign intermediary between the Forest Officers and the cultivators?—No.

30361. What principle do you follow in levying these various grazing rates; ordinary rates, privilege rates and commercial rates?—I should not like to say. We consider of course that even these privilege rates are unnecessarily low. Practically it comes to this, that Government wants to give the agriculturist feeding for his plough cattle for practically nothing. My idea is that you might as well give it free as charge an anna a year. This mixture of rates is really a great trouble. I would much rather have some simple system, some being free and the rest charged at a reasonable rate.

30362. Have you made any proposal with regard to this to Government?—Things have been discussed *ad nauseam*.

30363. Do you find any indication of stall-feeding becoming popular among the people?—I understand it is done in Berar, but then I suppose that is by force of circumstances to a great extent.

30364. Having perhaps come to the limit of the grazing area available from forests, perhaps that is the only direction from which improvement could come. You have discussed this question of stall-feeding with the Agricultural Department?—Yes, we have certainly discussed it. At different times attempts have been made to introduce stall-feeding; some of those attempts were made a good many years ago.

30365. Could you reduce the cost of fuel?—We could not reduce it much more than it is already. The dry fuel is one pice or two pice per head-load.

30366. You could not reduce it any further?—They used to have one pie, but nobody deals with one pie nowadays.

30367. Do you think better transport facilities would help to reduce the price?—No, all the dry fuel comes by cart. I suppose improvement of roads should help things.

30368. You made a reference to lac and sericulture in reference to the extraction of minor forest produce. Is there not a department known as the Department of Industries?—Yes.

30369. Is lac and sericulture under that department?—No, anything from our forests is entirely under our department, including all minor products.

30370. *Mr. Calvert:* You have referred to an area of 3,400 square miles as being closed to grazing; how much of that is also closed for cutting grass?—None of that would be closed, we do not prevent the cutting of grass in these closed areas at all. We would like to have it cut.

30371. The cutting of trees within 20 yards of a bank of a stream is forbidden; is that a rule under the Forest Act?—No, that is a rule made by Government.

30372. Under what authority? Under the Revenue Act.

30373. Have you in your staff a separate Forest Botanist?—No, not now in this Province.

30374. I gather you have practically no complaints with regard to soil erosion in this Province?—Not to any extent; one hears of it, but one cannot say that areas are definitely disappearing through erosion.

30375. The proposal has been made that the reclamation of land that has been eroded should be done by the Forest Botanist. In the absence of a Forest Botanist, it is difficult to know what you could do?—They have an afforestation scheme in the United Provinces. I believe it is a very fine scheme, but that is not run by the Forest Botanist as far as I know.

30376. You have nothing comparable to Etawa here, have you?—No.

30377. As the result of the research work which is being done at Dehra Dun, is there any likelihood of development of forest industries in this Province?—I think so. We have got one research officer as it is, and I hope the time will come when we might have another officer for that purpose, getting in touch with the markets, starting industries, and so on.

30378. Have you a Utilisation Conservator?—No, I am just taking the matter up and we are appointing an officer for a few months. I do not think we have enough work yet for a whole-time officer. We shall probably be putting an officer on for six months to try and get in touch with outside markets for the utilisation of produce.

30379. Do you think there is sufficient scope for industries subsidiary to forest produce?—I think in the lac industry in the village areas a good deal could be done.

30380. Paper?—No.

30381. Have you any Forest Engineers?—We have not.

30382. Is that because your forests are in accessible places?—No. It has been recommended several times by us, but Government has not approved of the proposal. It does not consider that there would be sufficient work for a Forest Engineer.

30383. That opinion was rather generally held at one time, but other Governments have now appointed Forest Engineers with beneficial results. Do you think you would increase your income by having a Forest Engineer?—I do not say we would do great things, but he could be put on the big road works and things of that sort, and I think that would lead to development.

30384. In the Central Provinces, your forests are generally in fairly accessible places?—Yes.

30385. So, the question of wood going to rot for lack of transport does not apply here?—No.

30386. *Sir Ganga Ram*: The very valuable produce of your forest which is bringing you a large sum of money is myrobalam?—Yes.

30387. Do you encourage the growth of that now?—We do not cut the tree that bears this fruit; under our Working Plans the *harra* tree is specially put down as not to be cut.

30388. How much revenue do you get from myrobalams?—The Balaghat district alone is giving us Rs. 30,000 a year, on a big contract we have got with a firm in Bombay; they pay Rs. 30,000 a year for all the *harra* in Balaghat.

30389. You give it out on contract?—Yes.

30390. They must be making a huge profit. Myrobalams worth Rs. 4 crores are exported from India to foreign countries?—There is a certain amount from outside.

30391. *Sir Henry Lawrence*: What is the total revenue from myrobalams?—I should think about Rs. 60,000 from the Government forests.

30392. *Mr. Wills*: A large quantity comes from Indian States?—There are large quantities outside Government forests.

30393. *Sir Ganga Ram*: You have got some match factories here?—There is one at Kota in Bilaspur district.

30394. Have you any wood specially suited for it?—That has become rather a difficult question.- The wood they have been using is the *Bombax malabaricum* or *semal* wood; they cannot get enough of it.

30395. I know that they have been going as far as Hardwar and other places for it. Cannot you grow some more of these trees? It is very easy to grow?—That is a point that is under consideration now; I very much doubt whether we should be able to create it in time or quickly enough for them. They have tried to make out that we can supply them with that in large quantities in 25 years, but there is nothing on record to show that we can do anything of the kind. Plantations like that are likely to be fairly expensive. As I put it up to Government, if they wish to keep this industry going they must be prepared to start these plantations and work them at a loss. My own idea is that they could use the *salai* instead of *semal*. We can supply them with any quantity they want of *boswelia serrata* instead of *semal*.

30396. *Semal* is the only tree which is suitable?—That is the only one they are using.

30397. I asked you whether you could not encourage the growth of *semal* trees?—It is very scattered; you get it on the alluvial soils along the streams; there is a tree here and there.

30398. It grows nicely on the banks of streams?—It would mean starting plantations.

30399. Would it not be worth trying?—As I say, if Government is prepared to take the thing up! I do not think we will ever make it pay.

30400. It would increase the wealth of the country?—There is only one match factory, and we should not be able to supply anything to them for twenty-five years; we have got to think twenty-five years ahead, I should say thirty-five years myself.

30401. You said you greatly advocate *babul* growing?—Yes.

30402. Do you advocate the growing of the trees on the sides of fields?—One does see them a great deal along the banks of fields, but I do not know whether the cultivator himself does anything in that line; I take it he does not. I fancy that all the *babul* that you see along the *bunds* on black soil is self-grown, but they could do a lot themselves in increasing the amount of *babul* in a place like Berar by taking the trouble.

30403. But it casts a very injurious shadow on the crops?—I cannot express any opinion on that.

No cultivator will put it on the side of his fields.

30404. Are there many camels in this Province?—No, very few.

30405. It is very good food for camels?—We used to use them for transport purposes a good deal, but we do not get many of them now. They have to come down from Rajputana side.

30406. Would you not recommend to Government to encourage camel breeding? There is good food for them here?—Camels do not do well in this Province; all the camels that we used for transport were sent back to the drier regions before the rains.

30407. The climate is unsuitable?—Yes.

30408. By forest roads, do you mean *kutcha* roads? They are not metalled roads?—Most of our roads are *kutcha* roads; they are not metalled roads, but there is no reason why we should not make our own metalled roads if we had a Forest Engineer.

30409. Are the slopes of your forestry land so well wooded that they do not let out the water when there is heavy rainfall?—Yes; I should say distinctly so.

30410. You do not lease forest slopes to the people for cultivation?—No.

30411. Is there a demand for it?—I should not think so

30412. Do you terrace anywhere?—The slopes in our forests are covered with tree growth, and we just work them in the ordinary way as we go along, under certain Working Plans.

30413. *Sir Thomas Middleton*: You graze about 3½ million cattle here?—Yes.

30414. Could you give us any sort of indication as to what proportion would be at privileged rates, what at ordinary rates and what at commercial rates?—I shall send figures.

30415. *Sir Henry Lawrence*: What is your total grazing fee?—Rs. 25 lakhs.

Sir Thomas Middleton: You say it is Rs. 14 lakhs.

30416. *The Chairman*: Would you let us have a statement, giving all those figures?—Yes.*

30417. *Sir Thomas Middleton*: I take it the position is that the Forest Department is practically the controller of most of the grazing; foresters have adopted as a definite policy the view that grass should be cheap and grazing dear; that policy was laid down at a conference in 1913 but nothing has yet been done to give effect to that policy; there has been no alteration in the relative charges?—That is what it comes to.

30418. *Sir Ganga Ram*: Are you aware of the system of keeping *bhusa*? We call it *mosal*. It is a cone about 100 feet in diameter at the base, and going up to a height of 40 feet; it is covered over with thatch, and there is a *kutcha* drain all round in order to keep off the rain water. It keeps the *bhusa* for a long time; I have seen *mosals* which have kept *bhusa* in good condition for five years. Are you aware of that practice?—We do not know anything about it.

30419. *The Chairman*: Do you know of any cases where cultivators have planted trees or shrubs for fuel purposes?—I do not.

30420. It was suggested by one witness before the Commission in this Province that the *karanja* tree might be used for that purpose. Would you support that view?—No. I do not think it produces a particularly good fuel; it would be good for the fruit from which oil can be extracted.

30421. What is your best quick-growing fuel tree?—*Babul* is as good as any other.

30422. In planting out *babul* in plantations, what spacing do you give?—We do it in lines of about 6 feet apart.

30423. Have you casuarina here?—No.

30424. *Sir Henry Lawrence*: Would it not grow here?—No; it will grow along the sea coast; it is largely grown on the East Coast near Puri.

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* *Vide* Appendix.

30425. The casuarina trees in Mysore are 50 miles from the sea?—It wants a very sandy soil.

30426. *The Raja of Parlakimedi*: Do you have in your forests any tanning species?—Yes. The *babul* bark is used for tanning. The bark of the *Terminalia arjuna* is used, but they cannot really use it widely because it is a tree that grows along the streams, and we object to the cutting of it.

30427. *Prof. Gangulee*: What about myrobalams?—It is of course the main thing but it is exported. I am thinking more of the local uses. Then there was a shrub called *tarwa* (*Cassia auriculata*) which was introduced in the Central Provinces towards the end of the War, and we were told to make a plantation of it. This is the chief tanning material in South India, the scientific name is *Cassia auriculata*, and it grows in Berar, but nobody would use it here.

30428. *The Raja of Parlakimedi*: What is your revenue under that head?—Nothing.

30429. *Mr. Kamat*: There is a paragraph in the latest issue of *Capital* which may interest you. It says: "The secret of turning tropical grasses and other fibrous substances into clothes to wear is believed to have been solved by Dr. Dinshaw Nanji of Birmingham University. Chemical processes are said to have been perfected for separating the fibres from the raw materials and preparing them for spinning"?—I have not seen that.

(The witness withdrew.)

APPENDIX.

Statistics of cattle grazed and rates paid in the Central Provinces for 1924-25.

Kinds of animals.	Ordinary rates (average).	Commercial rates (average).	Number grazed at ordinary and commercial rates (*a*).	Privileged rates (*b*) (average).	Number grazed at privileged rates (*c*).	Number grazed free.	Total grazing revenue realised.
	Rs. a. p.	Rs. a. p.		Rs. a. p.			Rs.
Buffaloes ...	0 12 0	1 8 0	258,266	0 4 0	129,995	1,629	
Cows and bullocks ...	0 7 0	0 12 0	728,299	0 1 6	1,756,607	(*d*) 228,847	13,97,526
Goat, sheep and other animals ...	...	...	420,142	...	2,285	457	
Total ...	...	...	1,406,707	...	1,888,887	230,933	13,97,526

(*a*) Number not available separately for animals grazed at ordinary and commercial rates.
(*b*) Rates vary from 1 anna to 4 annas per head.
(*c*) Number of cattle a cultivator may graze at ordinary rates is the number he is entitled to graze at privileged rates.
(*d*) Of this 180,290 are Berar cattle, where special rules are in force, not applicable to the Central Provinces.

RAO BAHADUR M. G. DESHPANDE, Nagpur.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) The present organisation of research work in this Province, judged by its results, is in no way unsatisfactory. I would, however, like to make one or more suggestions which, in my opinion, might be carried out with advantage. In the first place more facilities and more funds should be provided for district research by investigators on the spot. I am in favour of the formation of a Provincial Research Committee at Nagpur under the chairmanship of the Director of Agriculture. This committee would administer a special permanent research fund and the problems affecting the welfare of the agriculturists should be submitted to the committee by the District Officers with an estimate of the money and staff required to deal with them. The Research Committee would have the advantage of knowing what research schemes were contemplated all over the Province, and if the problem seemed a sufficiently important one would allot men and the means for undertaking the investigation. The central expert at Nagpur would act as an adviser to Deputy Directors in laying out and controlling such local research scheme in addition to carrying on his own general research laboratory or station.

It is not enough if competent research officers and administrators remain content with doing useful work themselves but they should train other workers in their respective lines. If this is done the country would have as many competent indigenous workers as India needs. The main advantage of employing indigenous workers is that they are not likely to be lost to the country in the latter part of their service after acquiring great experience at the cost of the State. This is generally the case with research workers brought from outside, and I am strictly of opinion that research workers should be as far as possible from this country.

Research work is of no value whatever to the agricultural masses unless the results obtained from it were brought to the notice of the cultivators and were incorporated in their general agricultural practice. If this is done, I am sure a special fund from the public would come forward and maintain the research work.

(*b*) I do not know any particular case in which the progress is not being made because of the want of skilled workers, or field or laboratory facilities for study, but it is a general fact that the results obtained from the research are not brought to the notice of the cultivators and are not incorporated in their general agricultural practice.

(*c*) Southern portion of the Central Provinces and Berar is a great cotton producing tract, and it will be quite advisable if some research on cotton breeding, cotton physiology, cotton technology, cotton entomology and cotton mycology is carried on. If some good comes out of this research it will be good for both the Government and the people. I would lay emphasis on the fact that the Agricultural Department should always take an opportunity of encouraging and, if necessary, subsidising non-official gentlemen who have facilities and are desirous of conducting small schemes of research work on their own farms under the direction and guidance of officers of the Agricultural Department. I have come across many such progressive cultivators, and with a little encouragement and help from Government there is a wide field for extending their knowledge of agricultural improvements at small expense and in a practical and effective manner.

QUESTION 3.—AGRICULTURAL EDUCATION.—Agricultural education should be of such kind as would create sympathy and taste for agricultural peasants and would acquaint the youths of the country with theory and practice of agriculture.

(i) Existing educational institutions and staff are quite inadequate for spreading general knowledge among the masses.

(ii) There is an urgent need for extension of teaching facilities all over the Province.

(iii) It will be a great help if the teachers in rural areas be drawn from agricultural classes. These teachers are well acquainted with the local conditions and can very well impress upon the cultivators the importance of agricultural improvement.

(iv) There are at present only two agricultural schools in this Province where the attendance of students was not so very satisfactory but is now gradually improving. Those schools are, in the first place, in their infancy and the people from rural areas have not realised the importance of education. If, however, the attempts are carried in the same direction the attendance will still more be increased and more schools will be needed.

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(v) The establishment of agricultural clubs in vernacular and Anglo-vernacular schools will, in my opinion, be the main incentive which will induce the lads to study agriculture. The teachers of these schools should take part in these activities and should try to divert the minds of the lads towards agriculture. The schools should be provided with small plots of land attached to the school where the boys interested in agriculture should be allowed to have small gardens and to enjoy the outturn for themselves. Every year the central educational institution (College of Agriculture at Nagpur) should invite such clubs and should show all the improvements carried on by the department. Students of the College of Agriculture at Nagpur should take a leading part in such activities and give the advantage of the knowledge to their youthful brothers.

(vi) I do not think that the pupils going to such schools should be mainly drawn from agricultural classes; advantage may also be given to other boys.

(vii) India is mainly an agricultural country and hence the general atmosphere even of primary schools, should be agricultural. In the last two classes of high school agriculture should be added in the groups of optional subjects; students selecting this group would have preference for admission into the Agricultural College. A portion of the time at school may be devoted to manual work. Courses in general agriculture, elementary botany, zoology, etc, be taught to the students of normal schools and the student taking up such courses be given preference for teachership in rural primary schools.

(viii) I am in favour of (*a*) nature study, (*b*) school plots, and (*c*) school farms.

(ix) Intelligent and hard working students generally come from middle class. If such students are selected and sent abroad for scientific training, the country would have competent indigenous workers in scientific field and thus the middle-class youths will be attracted towards agriculture. The tendency of bringing research workers from outside should at once be checked.

(x) Majority of students who have studied agriculture have up till now accepted Government service. Uneconomic condition of farming is really the chief cause of farming being not attractive to college graduates or even to high school men, unless they are content with a very low standard of living and unless they are prepared to work as peasants. In spite of all these adverse conditions, there are some progressive farmers in the country who can very well make use of the students turned out by agricultural colleges; but they are not really capable of acting as business managers in any commercial venture without actual experience. They should therefore be given more opportunities in the college for doing practical work.

(xi) I do not see any movement for improving the technical knowledge of students who have studied agriculture. Those who are already in Government service actually carry out the orders without even utilising the knowledge they have gained while students.

(xii) Adult education in rural tracts can be popularised by actual demonstrations in the field. I have no particular scheme in view for the present.

(xiii) With reference to adult education in rural tracts, there is a great deficiency in the present system of agricultural education. There are few, if any, facilities provided for the training of men of the field men type in specialised forms of agriculture from the practice of which such men can make a good living. In agricultural schools (like Powarkhera school), subjects such as well-making, working of boring machines, tractor driving, fruit cultivation, repairing of implements, *gur* manufacture, care of cattle, poultry farming, etc., should be taught to adults along with the boys. Practical knowledge of these courses should be given within a period of six months.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—Those that are deputed on the work should be men of courteous habits and should mix with the masses as if they were one of themselves. They should have demonstration lorries with all the necessary implements and accessories, and should send their programme in advance which should be framed not according to the convenience of the officers but according to the convenience of the people. The lorries should be of such a make as to be taken over the country roads.

(a) The following measures will, in my opinion, be more successful in influencing and improving the agricultural practice of cultivators—(1) Well-organised, continuous, intensive demonstration and propaganda work conducted in the districts, specially in co-operation with non-officials and non-official local bodies; and (2) the organisation of sources of supply and maintenance in the case of improved materials and of supervision and direction in the case of improved methods.

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The amounts of money spent on research work and on propaganda work are quite disproportionate, having regard to the relative importance of these two necessities in agricultural progress. Research work is of no value whatever to the agricultural masses unless the results obtained from it are brought to the notice of cultivators and are incorporated in their general agricultural practice. My experience as a member on the Board of Agriculture, Central Provinces, shows that money for research is generally comparatively easy to obtain, but the provision of funds for propaganda among the cultivators is almost ludicrously inadequate. I would prefer to pay more attention to propaganda work than to research side.

Use of lantern slides and, if possible, motion pictures would increase the effectiveness of field demonstrations.

(*c*) Indian farmers have shown willingness and even keenness in adopting improvements which promise to pay them, but there is no co-operation between them and the Department of Agriculture on account of the autocratic tendencies of the latter. I do not think if good methods are shown to the cultivators, they will abstain from expert advice. Courtesy on the part of Government officials is the only method I would suggest whereby cultivators may be induced to adopt expert advice.

(*d*) In majority of the cases demonstration and propaganda work has met with a failure. This is partly due to the non-realisation on the part of the farmers and partly to the negligence of the subordinates carrying on the work. The Department of Agriculture should therefore establish proper co-operation between the farmers and the subordinates before they proceed to start any part on these lines. Subordinates must be made to bear in mind that they are the servants of the people and to render honest advice to them is their primary duty. Unless this is done, I do not think any propaganda work can be successful.

QUESTION 4.—ADMINISTRATION.—(*a*) I feel that a better co-ordination of the agricultural activities of Governments in India, especially with reference to the means to be adopted for introducing agricultural improvements to the cultivators would be facilitated if provision is made for a fuller exchange of experience and opinions between officers of the Agricultural Departments of different Provinces, particularly of such Provinces to which certain problems are more or less common.

(*b*) I do not think it is desirable to increase the scientific staff of the Government of India at the present time; I would lay more emphasis on propaganda work.

(*c*) (i) From my point of view, Agricultural and Veterinary Services are far from satisfactory. The officials of these departments do not realise that they are the servants of the people and do not give the farmers the full benefit of their services. Supervising officers of these departments should therefore, insist upon their subordinates that they are public servants and should discharge their duties in the interest of the public.

(ii) As regards railway transport, adequate number of wagons are not available in the harvest season and railway transport cost about 50 per cent more in India than in countries like America. Railway companies should therefore be induced to grant concession rates to farmers. Besides this, pilfering is a common practice carried on by railway servants and hence the articles of farm produce never reach the consumer or the dealer in a safe condition. This is especially true in the case of orange industry. Railway authorities should therefore be insisted upon to have strict watch on the subordinates and avoid pilfering and damage during transit.

(iii) Indian farmers have to spend very much on transport. Communication from farm to village and from village to market is very poor, and as such not only costs much but increases the depreciation charges of carts and bullocks.

(iv) Meteorological Department is rather doing good work.

(v) and (vi) More post and telegraph offices should be opened in the rural areas.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—In India, the agriculturists are deeply in debt and the best way to help them is by development of co-operative land mortgage credit. The present credit societies of villages cannot satisfy their needs for meeting the old debts of their members or the purchase of land or making improvement in their landed estates. This will be possible when land mortgage credit is developed on a large scale. But the important point to be considered in this connection is whether the present organisations of primary village societies, the Central Banks, and the

Provincial Banks are suited to develop that land mortgage credit or altogether different institutions must be started to do the thing required. There seems to be no objection to developing it by the present institutions. The only precaution that is to be taken is to keep this branch separate from their short-term business and it should be financed from the funds obtained for long periods, either in the form of deposits or debentures, to which a reference will be made later on.

There cannot be two opinions on the question that co-operative land mortgage credit must be developed in India on a large scale, to relieve the agriculturist from their old debts. Whether separate institutions are to be started or the present credit institutions—the primary societies, the Central Banks and Provincial Banks can manage the land mortgage credit, is a secondary question.

Co-operative land mortgage credit, if properly introduced, will greatly benefit India. For the improvement of agriculture, for the adoption of machinery and modern methods, the employment of large capital is necessary. Modern farming is a business which must be supported by plenty of ready money. This is possible if agricultural credit is developed fully.

The next important question with regard to land mortgage credit is whether it can be developed in India. The answer to this question can be given in the affirmative; but the same rests on several important assumptions. It must, for instance, be taken for granted (i) that the laws of the land will be modified, where necessary, so as to favour an organised system of land mortgage credit; (ii) that owners of land will combine with each other in order to better their credit because they understand (*a*) the necessity for intensive cultivation, and (*b*) how to cultivate intensively, and (iii) that the necessary organising agency is placed at the service of the landowners. The introduction of a system of land mortgage credit in India will certainly require guidance and supervision and even State money but the last must be given in the form of a loan only in the beginning. In India it will be inadvisable for the State to stand aloof from a movement of this type. It is for the development of land mortgage credit that State loans should be made in the beginning in order that the investing public should learn the importance of this system. They will come to realise the security contained in the land mortgage bonds, when the State finances are forthcoming. Until the public realise this, the State should not take away its aid. In Egypt, for example, the State Bank holds shares in the Agricultural Bank of Egypt. The State must help the development of their business by other ways also. A guarantee of interest on the issue of debentures must be given by it to popularise them. There seems to be no objection for giving the guarantee as it involves no immediate expenditure by the State, and probably none at any time. The most satisfactory form of help is a State guarantee of interest on a limited issue of debentures for limited term in order to reassure the public as to the new investment and to give them time to become familiar with it. The guarantee can be given to a special land mortgage bank if one be started or to a Provincial Bank if it undertakes and manages the business through Central Banks and primary credit societies, as is being done at present by the Central Provinces and Berar Provincial Bank. Unless the debentures are made trustee securities, they will not be prized by the investing public; and this must be done by making necessary amendment in the Trusts Act.

A reference is made above that the Central Provinces and Berar Provincial Co-operative Bank, Limited, has been managing the land mortgage credit business through Central Banks and primary credit societies. It will, therefore, be not out of place to give brief details about the system introduced by this bank in the societies under the Akola Central Bank.

The Central Provinces and Berar Bank has advanced money to good and solvent members of some good societies affiliated to the Akola Central Bank, making these societies and that bank parties to the transactions. The loans are first made to the Akola Central Bank, the latter makes them to the societies which on their part transfer the amounts to their good and solvent members on security of first mortgage of their landed estates. The loans are made repayable during the course of sixteen years by equal annual instalments of 15¼ per cent. The mortgages are assigned to the Akola Central Bank by assignment deeds by respective societies and the former reassign them to the Provincial Bank by another assignment deed. Besides the mortgages, the societies execute demand pro-notes for amount of loan in favour of the Akola Central Bank which, in its turn, besides giving its own pro-notes, transfers them to the Provincial Bank. There is another security attached to this transaction, and that is the two securities are required to be given for the due repayment of mortgage debt.

Before any society is admitted to the scheme, it is the duty of the Akola Bank to investigate into the title of the prospective borrower. They have appointed a special committee for doing all primary work such as investigation of title

deeds, liabilities, etc. The loan is not advanced unless and until it is sanctioned by the Governor, Central Provinces and Berar Co-operative Federation, who is trustee for the debenture-holders and to whom all mortgages have been assigned to serve as security to debenture-holders. As regards recovery of money, the Akola Bank has held itself responsible under an agreement with the Provincial Bank.

The annual instalments, constituting a sum of Rs. 15¼ for every hundred rupees advanced represent Rs. 6¼ for principal and Rs. 9 as interest. The principal is held by the Governor of the Federation in sinking fund which is invested in Government paper while the interest is disbursed as under:—

1 per cent to the Akola Bank.

8 per cent to the Provincial Bank for the loans advanced by it.

In 1920, the Provincial Bank issued debentures of two series, carrying interest at 7 per cent and 6 per cent, respectively, and could easily dispose of the former on the face value of about a lakh, without any advertisement. The 6 per cent debentures were subscribed for a small amount though special privilege was given to the holders thereof, for getting them redeemed after a notice of six months, and the Bank has realised that out of two series of debentures carrying different rates, one carrying higher rate only is favoured by the public and hence it is inadvisable to issue two series of debentures carrying different rates of interest.

The Provincial Bank redeemed the 7 per cent debentures in 1924 because it had very heavy surplus fund.

There are some other points with regard to this scheme and they must be touched here.

First, as regards the mortgages, the mortgagor is required to repay the amount by 16 annual instalments of equal amount at 15¼ per cent, 6¼ per cent, representing the principal and 9 per cent interest. This 9 per cent rate is payable for all the six years on the original amount and not on the balance outstanding, and hence it is excessive. So instead of making the interest payable on the sum advanced, it should be made payable on the unpaid balance and in the latter case the scheme will be best appreciated by the landholders. The next thing about the mortgage is that the mortgagor has been given the privilege to redeem the mortgage after giving three months' notice of his intention to do so; this is an inducement for him to make his best efforts to be free from debt as early as possible. The third important condition is that in case of default in making payment of any instalment, the whole debt becomes due, and the society is at liberty to proceed against the defaulter in a court of law. So all possible safeguards have been taken in drawing out the mortgage deed, and hence it offers very good security for the debenture-holders.

Secondly, the sinking fund is maintained by the Governor, Central Provinces and Berar Federation, as trustee for the debenture-holders. As already said above, all the instalments for the repayment of the principal sums are held by the Governor of the Federation in a fund which is invested in Government paper or securities approved of by the Registrar. The interest accruing on the paper or other securities is credited to the fund and reinvestment in Government paper or otherwise directed by the Registrar. The debenture-holders are to be paid the money from this fund and any surplus that will remain will be distributed amongst the societies concerned, which will credit the amounts to their reserve fund. Now that the 7 per cent debentures have been paid off in full by the Provincial Bank the trustee will pay the former the loans made by it from the proceeds of the sinking fund investments. The Provincial Bank is at liberty to reissue the redeemed debentures any time during the currency of the mortgages.

Under the scheme, the Provincial Bank has agreed to make loans of a sum not exceeding Rs. 1,50 000 and it is entitled to issue debentures of the aggregate value of the mortgage loans made by it.

The effects of the scheme have been wonderful. Some of the mortgagors were able to redeem their mortgages within five years and some within four years even. There have been only a few defaulters.

QUESTION 10.—FERTILISERS.—(*a*) In my opinion, natural manures can be more profitably used than artificial fertilisers. Artificial fertilisers are most by brought to the Indian markets outside and they cannot be sold cheaply. Besides this, the economic condition of the Indian farmer is not so good as to make use of these costly and artificial fertilisers. The improvement of cattle industry is, in my opinion, the only direction in which we can proceed to maintain fertility of the soil.

So far, in our history, grain selling has meant selling fertility that has been stored up in the past ages; and it has been followed by impoverished soils and unprofitable agriculture. On the other hand we find farms in almost every locality in the United States of America and even entire countries can be pointed out where the fertility

of the soil has been vastly increased by livestock farming. The most marked examples of this are concerned with dairy farming.

I have observed that a dairy cow weighing about 1,000 lbs. yields about 12 tons of solid and liquid manure in a year. Under proper conditions from 70—80 per cent of the manure voided by farm animals may be saved and returned to the soil.

(*b*) Fraudulent adulteration of fertilisers can be prevented if they are sold to the farmers through the licensed sellers under the control of the Department of Agriculture.

(*c*) In the first place I will strongly advise farmers to use natural manures. If new and improved fertilisers are at all to be used, they should first be used on experimental farms and the result be shown to the farmers. If they see good results from the use of fertiliser, they will naturally be inclined to use them on their farms.

(*d*) I do not know any particular locality where considerable increase in the use of manures has taken place, but so far as I have seen, every farmer knows the value of manures and he tries to obtain as much manure as he can conveniently procure in his village.

(*e*) I do not think the effect of manuring with phosphates, nitrates, sulphate of ammonia and potash manures have properly been investigated in this Province.

(*f*) Education, propaganda are the methods, I would suggest, to discourage the practice of using cowdung as fuel.

QUESTION 11.—CROPS.—(*a*) (i) Condition of existing crops can be well improved by the use of natural manures and by adopting methods of proper crop rotation. The Department of Agriculture should show the methods to the farmers. Irrigation facilities should be widened.

(ii) Where irrigation is possible, crops like *alfalfa* (*lasun* grass) should be introduced. This would improve the existing condition of the cattle and maintain soil fertility.

(iii) The distribution of seeds to the farmers should be done through the selling agencies (in every tahsil) under the supervision of the Department of Agriculture; and the local bodies, like Local Boards, be encouraged to maintain such seed stores at every tahsil headquarters and supply seed to the farmers of the surrounding area.

(iv) Wild pigs and deer are mostly responsible for the destruction of crops, and although they are killed in large numbers they breed more quickly than they are killed. The Board of Agriculture has, I am told, passed a resolution on the subject to bring about increased destruction of pigs and other wild animals, but it is still under the consideration of the Government of India. The pig is a very hard animal, and is not likely to be destroyed by the slow process of resolutions but by active steps.

Government should be more liberal in granting licenses to the farmers.

(*b*) I have no such crop in view.

(*c*) No.

QUESTION 12.—CULTIVATION.—(i) Though the existing system of tillage is not very satisfactory it has still its own merits. From my personal experience, I have observed that the improvement of existing agricultural implements is more preferable to the introduction of new types. I have not seen practically any agricultural operation which was carried on in general farming practice in the Province where greater efficiency could not be obtained by the improvement of the indigenous implements in use. Such improvements must be cheap and easily effected in the villages.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(i) The efficiency and sufficiency of existing measures for protection of crops from external infection, pests and diseases are far from satisfactory.

(ii) Active action on the part of the department is now desirable.

QUESTION 14.—IMPLEMENTS.—(*a*) No.

(*b*) There is an unlimited field for developing trade in agricultural implements if the initial difficulties are surmounted by special measures. Firstly, the villagers are scattered over long distances and it is impossible for the trader to reach them. The second difficulty is financial, mostly the cultivators cannot pay in lump sum the price for implements. They want easy terms for payment in instalments. If the agriculturist is approached and relieved from financial difficulty, he is quite willing to go in for modern implements. Railway companies should also be approached to grant concesstions on agricultural implements.

(*c*) There are some difficulties which manufacturers have to contend with in the production of agricultural implements, but they can be removed. The Provincial Governments should take up this work by guaranteeing the manufacturing firms' orders in bulk

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for the purchase of implements. Thus there would be manufacture on the largest scale, which means production. Then again, local conditions should be studied to suggest the implements necessary for a particular area, and these should then be standardised and produced on a large scale.

QUESTION 22.—CO-OPERATION.—(*a*) (i) Co-operation is essentially a democratic organisation. It is an embodiment of the principle of self-determination and as such should not be mentored by the strong official hand. Nevertheless, the Indian masses, as they stand, need sympathetic and judicious guidance from above. Whether it be Government officers or the non-officials, they have all to approach the movement in a missionary spirit. For this, it is absolutely necessary that the heads of the Co-operative Department should be Indians. They are expected to know their countrymen better and the latter also will take the former as their own.

Secondly, these Government officers should, as far as may be, be drawn from the Agricultural and Industrial Departments, so that alongside with the supply of credit through co-operative organisations, they should be in a position to advise the agriculturist to put his money to best use and utilise his spare hours profitably. Being in touch with agriculture, they will be able to guide the members of the co-operative societies how to take advantage of and utilise improved methods of cultivation, select their seeds and choose their fertilisers. Lastly, being associated with the Industrial Department, they will be able to issue instructions to the ignorant members of the societies to turn their spare moments to a better account by taking to farm industries. Similarly, their assistants also should undergo a course of agricultural training. They should not lack in the knowledge of accountancy, economics and banking, and should be drawn as far as possible from the agriculturists.

Thirdly, there should be a close co-operation between the four departments of Government—the Agricultural, the Co-operative, the Veterinary and the Industrial, each uniting and supplementing the efforts of the other.

Fourthly, the Government officers of other departments, especially those of Revenue, Excise and Education, should strengthen the hands of the Co-operative Department by making it a point, whenever possible, but without proving a bore to the members of the rural societies, to visit and offer them a few words of advice. The Revenue Department can be of great assistance in composing their differences and bringing the defaulters to book. The Excise Department can help them in getting rid of their addiction to alcohol or liquor, if any. Education Department, if sympathetically inclined, can provide for the educational facilities of the children of the agriculturists. To say the least, illiteracy has been the greatest bane of the Indian society, to stamp out which no efforts should be spared. Legislative Councils and the local bodies can go a great length in this direction, but the actual administrative machinery rests in the hands of the Education Department. If the latter is guided by persons who have the country's good at their heart much can be done to improve the lot of the poor agriculturist. Our agriculturists have been easy victims of those who are gifted with better intelligence. They are also by nature a most conservative set of people and unless their vision is broadened by education, they cannot imbibe the ideas of co-operation with the result that the latter ceases to take root. Hence it is that Education Department should be the most active amongst those referred to above and lend all possible co-operation to them.

(ii) The non-official agencies best fitted to promote the growth of this movement are the federal bodies, divisional or provincial. All propagandist and educative part should be entrusted to them, and the Government should not grudge them a reasonable subsidy for their upkeep, even if it were to come from the pockets of the general taxpayer. Obviously the whole of Indian revenue has its last link in the agriculturist's home, and as such every pie that is spent from the general treasury has its reward and justification. By hloding courses of studies for the literate agriculturists and others interested in co-operation and rallies at convenient centres, and convening conferences from time to time and publishing tracts on the working of co-operation, co-operative education can be much popularised. The Government for their part should induce the right type of people to join the movement and show them a way to ameliorate the condition of the agriculturists.

(*b*) (i) Our credit societies and, for the matter of that, all primary societies have been so much under the tutelage of external agencies that they are lacking in creative genius. This is the reason why they always depend upon external financial aid. Secondly, the credit facilities are more often than not denied when they are sorely needed. For this many circumstances are responsible, chief among which are, firstly inability of the members to undergo the formalities of drawing upon their credit with their financiers, the Central Banks, in rainy season, and secondly, the defective means of communication. In some parts of the country, the land tenure is so fancy that

while the requirements of the agriculturists are as great as those of others more favourably situated, looking to the security of their holdings, the financing bodies are close fisted in satisfying their needs. For this it is necessary that their land revenue system must be changed. Their holdings must be made transferable, and it is then alone that they will be able to command adequate credit. In co-operation, it is no doubt honesty of purpose and prudential habits that are the main sources of credit, but human nature constituted as it is, has its weaknesses and drawbacks, and as such a mortgagable interest in one's holding is sometimes badly needed. Our credit societies are so much accustomed to paternal care and *taccavi* advances that they only take the Central Banks as old friends, *viz.*, the *sowcars* in the new garb. To remove this misapprehension education and propaganda are necessary to which a reference has already been made.

The formation of urban banks, especially of Government servants and of public bodies, should be encouraged to enable the needy persons to secure loans at reasonable rates of interest.

(ii) All animal life is composite, and so is that of the agriculturists. Money or credit is not the only sinew of the war. An agriculturist produces his crops by the money supplied by Central Banks but that done, he is again at the mercy of the cunning of the *banias*. He does not know how to put his produce to the market. Very often he is being pressed by his creditors for the payment of money borrowed off them and he has to part with his produce before the market is settled or to sell it to the *bania* himself for the price quoted by him. For this, it is absolut ly necessary that sale societies must be organised. The experiment has been successfully tried in some of the places in the Bombay Presidency. The Government should take steps to organise these societies at convenient centres in each district. it goes without saying that, in the beginning, their working will have to be supervised by the Government.

(iii) In the money market, the common maxim is that we should but at the cheapest and sell at the dearest, but our agriculturists have often to reverse this order. Credit gives the agriculturists the wherewithal with which to buy his necessaries, but where to buy them profitably is always a besetting question with him. An agriculturist is in need of several things such as seed, fertilisers, machinery, implements, tools, etc., and articles of every day consumption. For this purchase societies must be provided.

Now whether all the three functions detailed above should be combined in one and the same society so that it should be a self-sufficient body is a point on which there is a difference of opinion, but expert advice demands that these different functions should as far as possible be kept apart and not allowed to impede the growth of others

(iv) These societies can be organised and run in areas where irrigation works are in progress and great reservoirs are being sunk. We mean to say such an area provides you with a favourable ground. Once these experiments succeed, even a modest village could start a society of its own and carry on its work in the neighbouring villages. Often times we find a group of labourers working together without being conscious of the fact that they are translating the principle of co-operation into action partly. Advantage should be taken of such groups and they should be placed on a proper footing. Unfortunately the Central Provinces has not got such societies, the formation of which should be encouraged.

(v) Aggregation of fragmented holdings is a great desideratum of the present agricultural community. By accretion of time, the Hindu joint family system has given rise to minute sub-divisions of land which have upset all calculations of fruitful agriculture. Punjab co-operators have taken the initiative in the matter, and if their experiments attain a reasonable degree of success, other Provinces should follow suit.

(vi) There is an instance of this kind in this Province. Jalgaon is a taluk town in Buldana district in Berar. The Agricultural Association there purchased improved ploughs and rented them out on a nominal fee. The result was that while nobody had to bear the burden of investing a large amount in the purchase of implements, everybody had the good luck to enjoy the fruitful results of co-operation. Nevertheless, where the use of improved machinery is yet far from commending itself to the acceptance of the average agriculturist, reasons apart, it will be premature to try experiments of this type. In this respect, if at all, it is the Agricultural Department which must have the honour of establishing the claims of modern machinery.

(vii) If joint farming is something different from joint cultivation, then it must be stated that the former has little chance in places where whole of the arable land has been brought under cultivation. These experiments could be tried only in such places where waste land is yet available or the forest land need to be reclaimed.

(viii) Somehow cattle-breeding societies have been a failure in this Province, and we have hardly any information about the same.

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(ix) Pig-hunting clubs, malaria prevention clubs, village sanitation preservation societies, co-operative stores—these are some of the branches of co-operation which offer a wide field for co-operative activity.

In short, given enthusiastic souls actuated with a warm patriotic feeling and imbued with liberal ideas it is possible to organise the whole countryside co-operatively. Denmark has set a noble example and we should be guided by it, not forgetting at the same time our limitations and disabilities. Unfortunately, the local Co-operative Department is too conservative in this respect. Reason might be that the department does not get competent officers, and if it happens to get a few here and there, they do not choose to continue, presumably because of the fact that the department does not offer attractions of executive service. For this it is necessary that men of the Provincial Service possessing long and varied experience should as far as possible, be absorbed in the Co-operative Department.

(*c*) We think that from the experiments made in each of these branches we are not yet in possession of sufficient data to warrant any such piece of legislation.

(*d*) Whether a co-operative society is really so or otherwise depends on the criterion you employ. If punctual repayment of loans were the only standard applied, and it is often applied, many societies, why most of them, would not come up to satisfaction. On the contrary, if the test whether the society is run on co-operative lines or not were applied, some could be declared to have achieved their object. In Berar and Bilaspur districts and for the matter of that in every district of the Province, there are some societies which could be said to have attained their aim but it must be admitted that their number is limited.

Oral Evidence.

30430. *The Chairman*: Rao Bahadur Deshpande, you have provided the Commission with a note of the evidence that you desire to give. Have you any statement that you wish to make at this stage in amplification of your written statement?—No.

30431. What is your occupation?—I am a malguzar landholder.

30432. From where do you come exactly?—I come from a village 32 miles from Nagpur.

30433. How many acres have you?—More than 2,000 acres.

30434. In one village?—In 22 villages.

30435. Have you a home-farm?—Yes, I have.

30436. Do you cultivate that yourself?—Yes, through my servants.

30437. Have you leased out any of your farm land?—I do not lease out my land generally.

30438. What are the principal crops in your district?—In my village we sow cotton, wheat, *juar*, *tur*, and other pulses, and in some places also rice.

30439. Are any of your lands irrigated?—They are irrigated by my own tanks not by Government tanks.

30440. Would you describe in a little more detail the system of irrigation you have adopted? How is the water stored?—We collect water in the rainy season.

30441. Have you any wells?—We have wells only for gardening purposes, not for irrigation purposes.

30442. Are you growing any sugarcane?—Not much, because generally sugarcane is damaged by pigs and jackals.

30443. Turning to the substance of your note of evidence, on the first page you recommend the formation of a Provincial Research Committee at Nagpur under the chairmanship of the Director of Agriculture. How exactly would you suggest that the committee should be constituted?—The committee should consist of the Director of Agriculture, some non-officials, and experts on the different subjects.

30444. You suggest that the committee should be charged with the administration of a permanent research fund?—Yes.

30445. How do you suggest that that fund should be acquired?—Government should supply it.

30446. Would you appeal to the public?—I do not think that the public will be able to give sufficient funds for the purpose of research work.

30447. Do you not think that important landholders might regard it as a privilege to contribute to a fund of that sort?—That fund will not be much utilised for their requirements. They will voluntarily contribute if they find out that the research is profitable to their cultivation.

30448 I gather that it is your view that on the whole and having regard to the funds at its disposal, the Agricultural Department is at this moment discharging its duties satisfactorily?—They are discharging their duties satisfactorily, but not to the satisfaction of the public, because they have no funds at all.

30449. And I judge that, in your view, the weak spot in the existing system is the demonstration side of the work?—Yes.

30450. And in particular the qualifications of the men engaged in demonstration and propaganda amongst the cultivators?—Yes.

30451. Is that shortcoming due, do you think, to the class and calibre of men recruited for the purpose or is it due to their want of training?—We have not got sufficient men at present.

30452. But the men you have got, have they sufficient training?—I think so.

30453. On page 297, you advocate the establishment of agricultural clubs in vernacular and Anglo-vernacular schools. I do not quite understand what you mean by agricultural clubs?—The students who take agriculture in the schools should form themselves into a club and under the direction of their teachers should have training in their own place or in any central place where the Government has got its farms; that is what I mean.

30454. So that you would make agriculture a non-compulsory subject and a non-examination subject, and you would have these agricultural clubs in order that those boys anxious to take up agriculture should in their leisure acquire a certain knowledge in agriculture?—I think it should be an optional subject in place of some of the subjects at present taught in the high schools.

30455 Have you anything to tell the Commission about adult education which you have not set down in your note? Have you any experience of experiments in adult education in your district?—The farmers who are grown up should be trained by demonstrators; they should be allowed to go to the Government farms and see what the agricultural people are doing; that sort of education will be sufficient for them at present.

30456. Do you think you see any increasing demand for education amongst cultivators in your district?—Yes; they are keen about it.

30457. Are you confident on that point?—Yes.

30458. Do you think there is any sign that the cultivators are willing to pay for such education?—About payment I doubt very much; but they will come forward if they are given free instruction as regards cultivation, manure and other things and they will follow the instruction well.

30459. You point out the need for better communications; who do you suggest should pay for those?—Government and the District Councils.

30460. Do you distinguish in your mind between Government and the tax-payer in the matter of finding money for these purposes?—The roads maintained by the District Councils are paid for by them.

30461. You think District Councils have laid on them duties which they cannot discharge through lack of funds?—Yes; that is the difficulty in Nagpur at least.

30462. Are you a member of your District Board?—Yes.

30463 Is there a demand for better communications?—Yes.

30464. And for further education?—Yes; but owing to want of funds the District Board cannot undertake all these things.

30465. Which is the most vocal and most active, the demand for better education or the demand for better roads?—The demand for better educatino.

30466. That comes first in the eyes of the local authorities?—Yes.

30467. You give us some interesting figures on the question of financing agriculture on the land mortgage system and also on the co-operative movement. What experience have you yourself had in these two fields ?—In the co-operative movement I was the Secretary of the Central Bank and at present I am one of the Directors of the Nagpur Co-operative Central Bank; I am also the Managing Director of the Provincial Bank here in Nagpur.

30468. Of the Apex Bank ?—Yes.

30469. I do not quite gather from your note whether you suggest that a credit founded on land mortgage should be given entirely through the co-operative movement. Do you suggest that the land mortgage should work entirely through the co-operative societies ?—Through the Apex Bank and the Apex Bank should advance to the Central Banks.

30470. What organisation do you suggest should come in direct contact with the cultivator ?—The Central Bank; generally the societies come in contact with the cultivator, not with the Central Bank directly.

30471. The primary society ?—Yes.

30472. I think that the experience of this Province suggests that it is very necessary that the primary societies should discharge their duties properly ?—Yes; they are still illiterate, and it is very difficult for them to manage their own accounts, because they cannot write them.

30473. They must be encouraged to take as much interest in their own affairs as possible ?—Yes.

30474. Does this scheme for a land mortgage bank system set out by you embody your own ideal or is it some scheme which is under consideration at this moment ?—I attended the Provincial Conferences at Bombay and Poona and there they have got this scheme and we are also thinking of opening the same here.

30475. Is it your view that a proportion of the short-term loans taken out from the primary credit societies by cultivators are, in fact, applied to objects which are not short-term, but are, in fact, improvements and ought to be financed on long-term loans ?—Short-term loans are generally applied for their own current needs. The Central Banks generally advance loans to societies for their own needs.

30476. Now, in your experience of the management of the Central Bank, were you satisfied with the apparatus at your disposal for examining the assets and liabilities of applicants for loans from credit societies ?—At present we are doing it with the agency we have got. We have got only *sirpanches* and secretaries who generally go through the assets and liabilities of the members and forward the applications to the Central Banks.

30477. And do you think that that plan gives the Central Bank an opportunity of urging the suitability of the applicant ?—We have got one material benefit. We get the audit notes of the Government Auditors and we compare the audit notes and the application of the member and then we decide whether we can advance the loan or not. Generally, Central Banks scrutinise these applications.

30478. Do you come into close contact with the cultivators on your estates ?—Yes.

30479. How far from Nagpur is your property ?—In Wardha district; there I have got two or three villages six miles from the Wardha town.

30480. How far is that from Nagpur ?—More than 50 miles.

30481. Would you tell the Commission what period of the year you usually spend on your own lands ?—I generally visit my villages once a month.

30482. Do you reside on your own estates ?—I have got my house there, but I generally reside at Nagpur.

30483. You mitigate the disadvantages of absenteeism by repeated visits ?—I could not be considered an absentee landholder because I generally know my land and everything connected with it.

30484. Under what system of tenancy do cultivators on your lands hold their cultivating rights ? Is it absolute occupancy ?—Some hold on absolute occupancy, some are *malik-makbuza*. The ordinary rights have been removed according to the

new Settlement Act. We have got three sorts of tenants: *malik-makbuza*, absolute occupancy tenants and occupancy tenants.

30485. Have you villages where the fragmentation of holdings is a serious bar to agricultural efficiency ?—No.

30486. Do you consider the existence of these three separate systems of tenancy right is, in any way, making difficult the management of your estates ?—No.

30487. Have you any primary credit societies at work on your own lands in your own villages ?—There were some, but now they have been cancelled.

30488. So that in fact in all your 22 villages you have no credit societies ?—No; because we advance them at the same rate at which the banks also advance them.

30489. Who is we ?—I myself, because I have also got a moneylending business.

30490. Do you lend money to your cultivators at the same rate at which the banks also advance it ? Which bank ? Is it your own bank ?—The Nagpur Central Bank; we are now comparing the co-operative banks.

30491. It is the same thing as saying that it is the rate at which the primary credit societies lend money. Is it 12 per cent ?—At times I lend at 9 per cent; it depends on the credit of the tenant.

30491 Have you ever taken steps to encourage the spread of the co-operative movement on your own estates ?—No.

30493. Do you carry out any research or demonstration in collaboration with the Agricultural Department ?—No, I do not carry out any demonstration, but as a member of the Board of Agriculture I carry out their instructions as regards seed and implements.

30494 Is that carried out in close touch with the department ?—Yes. In the Wardha district the Agricultural Assistant generally comes to my village and gives instructions.

30495. Have you any arrangements with the Agricultural Department for growing and distributing improved seed ?—In the beginning I took seed from the Agricultural Department, but now I have got my own seed.

30496. And do you in fact distribute seed of improved varieties ?—Yes, to my tenants.

30497. How do you finance that ? Do you finance that as a loan to your tenants ?—I advance seed and take cotton in return. Supposing I advance four *khandis* of seed, I get two *khandis* of cotton in return.

30498. What about the condition of the cattle in your villages ? Are you satisfied with that ?—No; they are very poor. We cannot get sufficient bullocks.

30499. What about your local breeds ? Are you satisfied with the breeding ?—I am satisfied with the breeding, but they are not strong enough to pull the ploughs.

30500. Why are they not strong enough ?—That is due to the grazing rules.

30501. And not to the breeding ?—We have got bulls from the Government but we are not getting good bullocks for our cultivation. We get only small pairs worth about Rs. 200 I do not know why.

30502. Have you seen any of the experiments in preserving fodder that are being carried out by the Agricultural Department at various stations ? I am thinking of silage making ?—I have, but I am not following that in my own villages.

30503. Why not ?—Their system seems to be rather different because they keep fodder in a ditch and they cover it up with mud. Our village people have not been sufficiently educated in that; they say that that process would spoil their fodder.

30504. But do you not know that things would be much better if that were done ?—I have got no faith and confidence in it.

30505. *The Raja of Parlakimedi*: You say, at page 297, that the recruitment of boys to agricultural study should not be confined entirely to the agricultural classes. Are you sure that boys of other classes will take to the study of agriculture if you do not hold out to them a promise of Government employment or a grant of land ?—In that case perhaps they will not; I am not sure how many appointments can be given to them.

30506. Do you not think that it is better to restrict it to agriculturists who will be benefited by the study of improved methods and who would go back and improve their land?—Yes, if a sufficient number come forward; but my experience is that we are not getting agriculturists to come to the schools. Very few agriculturists send their boys to school.

30507 And do these so-called educated people come to the rescue of these people to teach the improved methods of agriculture?—Those who have sufficient land and cultivation generally go back to their respective villages and make improvements in their lands. But those who have got some 10 or 12 acres generally stick to Government service.

30508. Are you for modifying your proposal that people who possess a certain amount of land only should be recruited?—I am not sure about that.

30509. *Sir James MacKenna*: In paragraph 1 of your memorandum, on page 296 you say: "The present organisation of research work in this Province, judged by it's results, is in no way unsatisfactory." But although you give this qualified approval to the research work of the department, I infer from your subsequent remarks that you are not quite satisfied with the department on its demonstration side?—Not because they are not doing any work, but because they have not got sufficient staff or sufficient money.

30510. On page 297 you say, "Those that are deputed on the work should be men of courteous habits and should mix with the masses as if they were one of themselves" On page 298 you say, "Indian farmers have shown willingness and even keenness in adopting improvements which promise to pay them, but there is no co operation between them and the Department of Agriculture on account of the autocratic tendencies of the latter. . . . Courtesy on the part of Government officials is the only method I would suggest whereby cultivators may be induced to adopt expert advice." Again on page 298 you say, "From my point of view, the Agricultural and Veterinary Services are far from satisfactory. The officials of these departments do not realise that thay are the servants of the people and do not give the farmers the full benefit of their services. Supervising officers of these departments should, therefore, impress upon their subordinates that they are public servants and should discharge their duties in the interest of the public". What is the reason for these pessimistic remarks?—What I meant is this. I do not say that the Agricultural Department are not doing their work, but it is on very rare occasions that they go and see the tenants themselves. Therefore they never come in contact with the tenants. In that way I say it is not satisfactory.

30511. When you say that the supervising officers of these departments should impress upon their subordinates that they are public servants and should discharge their duties in the interests of the public, are you referring to the demonstrating staff or the superior staff?—I am referring to the demonstration staff.

30512. You think they do not get sufficiently into touch with the people?—Never, because they have not got sufficient staff. One man in a tahsil where there are 500 villages is entirely insufficient.

30513. So that you think Deputy Directors should inculcate in the minds of their subordinate staff the principles that you have here enunciated?—Yes.

30514. On page 304 you say: "Whether a co-operative society is really so or otherwise depends on the criterion you employ. If punctual repayment of loans were the only standard applied, and it is often applied, many societies, why most of them, would not come up to satisfaction. On the contrary if the test whether the society is run on co-operative lines or not were applied, some could be declared to have achieved their object." As a prominent co-operator, which criterion would you apply, co-operative enthusiasm or business instinct?—I think punctuality should not be the only criterion because punctual payments depend on the harvest. If the members have not had a good harvest, it is impossible for them to make repayment on the due date.

30515. Then you would prefer co-operative enthusiasm?—Yes, thrift, honesty etc.

30516. Honesty apparently comes second?—Yes.

30517. *Prof. Gangulee*: You are a member of the Board of Agriculture?—Yes.

30518. How long have you been a member?—About ten or twelve years.

30519. You stay most of the time in the Nagpur city, do you not?—Yes.

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30520. Have you paid frequent visits to see the research work done by the Institute here?—At times, not frequently, and only with reference to cotton.

30521. You are very keen on cotton?—Yes.

30522. Have you paid a visit to the Agricultural College?—Yes.

30523. That is to say you are in touch with the work that is being done here?—Yes.

30524. Do you know any particular item of research work that is being done here at the present moment?—I only see the cotton.

30525. You do not know the type of research work being done at the Research Institute here?—No.

30526. So that when you say that the present organisation of research work is in no way unsatisfactory, you simply base your remarks on impressions?—No, as regards cotton I give my own view. As regards cotton, the department is doing its best. We have got good varieties of cotton at present.

30527. On page 297 you say, "The tendency of bringing research workers from outside should at once be checked." On what do you base your view?—I only say we must try to Indianise the services; that is my object. We must do our best to have our own people educated in research work.

30528. Have you had occasions to compare the efficiency of Indians with that of Europeans?—At present Indians are not given any chance in research work; most of the people are brought from outside.

30529. On page 296 you say that the Agricultural Department should encourage and, if necessary, subsidise non-official gentlemen who have facilities and are desirous of conducting small schemes of research work. Have you any particular scheme in mind?—No. I have got no scheme.

30530. Then you want patriotism on payment. On page 297 you make reference to the uneconomic condition of farming. What is the total acreage of your home-farm?—I have stated that it is more than 2,000 acres.

30531. Your crop is chiefly cotton?—Cotton, wheat and rice.

30532. What profit do you get from your cotton?—That depends upon the harvest. I cannot say exactly what profit I get to-day.

30533. When you speak of the uneconomic condition of farming, what have you in mind; is it that the profit per acre is so small?—I say that it does not pay the agriculturist.

30534. Does it not pay you?—No.

30535. But still you are going on with it?—Yes. Because there is no other business; that is the only reason.

30536. Have you any suggestion as to how to make farming pay?—Unless Government comes to the help of the agriculturist and gives the money required at a low rate of interest, there can be no improvement, because we generally have to borrow from the *sowcar*.

30537. Surely money is not a handicap in your case?—No; but unless the agriculturist gets the money at a cheaper rate of interest I do not see how he can prosper.

30538. On page 297 you say, "I do not see any movement for improving the technical knowledge of students who have studied agriculture. Those who are already in Government service actually carry out their orders without even utilising the knowledge they have gained while students". Could you amplify that a little?—I say they merely carry out orders.

30539. Who are the students already in Government service of whom you speak?—Agricultural Assistants and demonstrators.

30540. They simply carry out the orders and they do not utilise knowledge that they have gained?—Yes.

30541. Have you any specific case in mind?—No, but generally I find that. In the villages they generally carry out the orders given by the high officials.

30542. On page 302 you say, "The Government for their part should induce the right type of people to join the movement and show them a way to ameliorate the condition of the agriculturists." In reply to the Chairman you said that there are no primary societies in the 22 villages under you. I take it that you are a very influential malguzar and a Rao Bahadur. What suggestions have you to make when you say that Government should induce the right type of people to join the movement?—I mean those who have really got a knowledge of co-operation.

30543. I suppose you have knowledge of co-operation?—I began from the beginning, so that I profess to have some knowledge of co-operation.

30544. And yet you have no primary societies in your 22 villages?—I have already explained to the Chairman why societies have not developed.

30545. You are a member of the Local Board?—Yes.

30546. You say there is a demand for education?—Yes.

30547. Are there any schools run by you personally in these 22 villages?—There are no schools managed by the malguzars; they are run by the District Councils. We help them.

30548. How many primary schools are there in your 22 villages?—I think in the Wardha district where I have got villages there are 4 or 5 schools. I am only a member of the Local Board.

30549. *Mr. Kamat:* You complain in your memorandum of the amount of money spent on research as compared with the amount of money spent on propaganda and say that they are disproportionate. Further on you say that the provision of funds for propaganda amongst the cultivators is almost ludicrously inadequate. Will you please illustrate these statements by figures if you can remember them. How much is spent on research and how much on propaganda?—I cannot give you the figures exactly, but I will say that the staff they have engaged for propaganda work is not sufficient to educate the agriculturists. That is what I mean. I do not know exactly how much they are spending on research work, but from the knowledge I have I find that they have not got sufficient staff for propaganda. Therefore I say that the amount spent on propaganda work is insufficient.

30550. When you say that these two things are disproportionate, I would like to ask you whether it is one-fifth or one tenth?—I cannot give you the exact figure.

30551. In another place you say that the system of land revenue prevailing in this Province should be changed; could you amplify that a little?—In the case of the co-operative movement, I find that the members of a society do not get sufficient money because they have no transferable holdings.

30552. And you therefore think that your land tenure system is faulty?—That is what I say.

30553. Is that the general feeling among the malguzars, that this system ought to be changed?—There is no such feeling among them.

30554. That is your personal opinion?—Yes. In the case of the co-operative movement, the land will never go into the hands of the *sowcar* or anybody else.

30555. Is this feeling growing day by day amongst the malguzars of the Central Provinces?—No; the Central Provinces malguzars are not very keen in giving transferable rights to the tenants.

30556. *Sir Henry Lawrence:* But you advocate it all the same?—Yes. In the case of co-operative societies, I say that members who are malguzari tenants should be allowed to lease out their lands to the society for more than one year, but according to our tenancy laws they cannot lease out the land for more than one year.

30557. *Sir S. M. Chitnavis:* On page 296, you say, "There are at present only two agricultural schools in this Province". Where are they situated?—One is in Powerkhera and the other at Chandkhuri.

30558. Is not the school at Chandkhuri closed?—When I visited it, it was not closed; at present I do not know.

30559. You have visited the place?—I visited it along with Dr. Clouston.

30560. You advocate the establishment of agricultural clubs in vernacular and Anglo-vernacular schools. What is the age of the boys attending vernacular schools?—I say it should be for the 5th, 6th and 7th standards of the vernacular schools.

30561. Not for vernacular primary schools ?—No; for the higher vernacular standards, the 5th, 6th and 7th.

30562. You want these clubs in middle schools?—Yes.

30563. How many of them are there in the Province ?—I want to introduce this system; I do not know how many there are at present; I want to have the clubs with agriculture as the optional subject in these schools.

30564. On page 297 you say that the general atmosphere, even of primary schools should be agricultural. In what way would you make it agricultural?—I mean that students going from primary to normal schools should have agriculture as an optional subject.

30565. You want it for students going from a primary school to a normal school and in the normal schools they would have agriculture as an optional subject?—Yes

30566. Not in primary schools ?— No.

30567. Have you visited the Powarkhera Agricultural School and studied the curriculum there at present ?—I have not visited it recently.

30568. You advocate that the students should be taught well-making, working of boring machines and tractor driving ?—That is for the education of adults.

30569. You stated that there was keenness on the part of the villagers for education ?—Yes.

30570. Is it not the practice in this Province that the school master has to go round every morning to the houses and bring the boys to the school, and that a great deal of his time is spent in this way?—At present, I do not think he is required to do that. An absentee landlord will not have any idea of what is going on in the villages. I know that generally the *kotwals* do the duty of collecting the boys.

30571. My experience as a District Officer is that the *kotwals* nowadays do not go round to bring the boys to school; the village masters have to go round and bring the boys to school every morning?—I have got no idea about that; if the school master has to do it, there will be no education for the boys.

They teach for two or three hours in the afternoon.

30572. You said that you gave 4 *khandis* of cotton seed and took 2 *khandis* of cotton. What is the difference in the prices?—It depends on the prices; suppose the price of cotton is Rs. 50 and the price of cotton seed Rs. 25 a *khandi*, then you must calculate according to those prices. You cannot say exactly what will be the price and the profit.

30573. Do you do any grain lending as well?—Yes.

30574. What is the usual rate?—It is *sawai*; that is the usual custom in th villages.

30575. *Prof. Gangulee*: What is the rate?—25 per cent; that is the *mahajan* system.

30576. *Sir S. M. Chitnavis*: On page 300, you say, "So far, in our history, grain selling has meant selling fertility that has been stored up in the past ages". Can you explain what you mean by that?—That is as regards fertilisers. I say that if you keep more cattle, you will have sufficient manure for improving the land.

30577. Have not the people got a sufficient number of cattle?—No; they have not got sufficient manure even; that is the reason why agriculturists generally suffer.

30578. Is not that due to the use of cowdung for fuel?—Not in the Central Provinces. In Berar, I think they are using cowdung for fuel.

30579. On page 301, you say that Local Boards should be encouraged to maintain seed stores. Have you not got Agricultural Associations and Seed Unions which maintain seed stores?—If I am right, the agricultural Associations are in existence only in name; no meetings are held, and nothing is done about seeds.

30580. Have you not seen them in Berar and in the north of the district, at Sehora and other places?—No. I am speaking of Nagpur.

30581. You want Government officers of the Revenue and other departments to co-operate in the matter of agriculture and co-operative work and things of that kind. Were not they doing it in the past, and have not they discontinued it owing to the

attitude of the people towards their work?—So far as my knowledge of the Nagpur Central Bank is concerned, I do not think they have given any help either in its organisation or anything else; it is all done by non-officials.

30582. You say, "Given enthusiastic souls actuated with a warm patriotic feeling and imbued with liberal ideas, it is possible to oraganise the whole countryside co-operatively". But you go on to say, "Unfortunately, the local Co-operative Department is too conservative in this respect". Is it that they do not allow any of these enthusiasts to come into the movement?—I do not say th t they do not admit them; hey do not come.

30583. Is it due to the fault of the Co-operative Department, or is it the fault of the people that they do not come and take part in the movement? What methods would you employ for encouraging them to come and take part in this movement?—We cannot give them any allowance to induce them to come; it is their option; if they come, they are welcome.

30584. The Co-operative Department does not discourage them from coming?—No. You know it, much better than I do because you are Chairman of one of the Central Banks.

30585. *Sir Henry Lawrence*: You spoke of the want of funds of the Local Boards. Do they receive any subvention from provincial revenues?—They do.

30586. To what extent?—I think the cesses which the Government collects from the malguzars for education and other purposes are transferred to Local Boards.

30587. There is an additional cess on malguzars?—Yes.

30588. How is it levied?—It is levied, but I do not know exactly what the amount is. Some cess like the educational cess is levied.

30589. What is the rate?—I do not exactly know, but I think it is half an anna in the rupee.

30590. Do you not pay it?—I pay it, but I do not know the exact rate; I think the rate is half an anna or 1 anna in the rupee.

30591. When was that introduced?—Long ago.

30592. There has been no new addition to the rates on malguzars?—No, it is not a new cess.

30593. Does the Local Board levy a special educational cess?—No; they have been authorised to do it, but they have not done so up till now.

30594. Under what law have they been authorised to levy this additional cess?—According to the Local Self-Government Act.

30595. In what year?—About 1923, I think.

30596. That is specifically for the purpose of introducing compulsory education?—For compulsory education and other things also, because up till now there was no compulsory education cess; now they have allowed them to levy market dues and also other dues; but the Nagpur District Council has not undertaken to do that up till now.

30597. What is the local fund cess which you now levy?—I cannot give you the exact figure.

30598. Is it an anna in the rupee?—I think it is 1 anna in the rupee, collected from the malguzars.

30599. And the Local Board has the power of raising that 1 anna to 2 annas?—The Local Boards have got no powers, but according to the Act, if they want to do so they can collect; but they cannot raise it to more than the Act allows.

30600. Will you explain the point further?—The Local Boards have got no power to raise the cess fixed. As regards market dues and things of that kind, they can increase them, but as regards the cess which the Government hands over to the Local Board, I think the District Council has got no power to increase it.

Mr. Wills: The local bodies can impose a special cess under the Local Self-Government Act for purposes of education.

30601. *Sir Henry Lawrence*: What is the amount of that cess which they impose?—It is hardly ever imposed; it has not been done in Nagpur.

30602. If the Local Board desired to have some more revenue, they have the power to impose it?—Yes, they can get more income by that means, but they are not willing to do so; I cannot say why.

30603. Has it ever been discussed in your presence?—No.

30604. *Sir Ganga Ram*: Are you in service?—No; I am a malguzar.

30605. But a man in service can be a malguzar. How much revenue do you pay?—I pay more than Rs. 5,000 as land revenue.

30606. Are you interested in any industries?—No.

30607. Your chief source of income is land?—Yes.

30608. But did you not say that land does not pay?—Land and moneylending are the sources of my income; land does not pay.

30609. You advocate boys going in for agricultural education; with what view? To go in for farming or for taking up service?—My chief aim is that they should improve their own farming.

30610. Is there any instance here where a boy has done that?—There are a few such cases.

30611. They did so after getting a degree from the Agricultural College?—Yes. When they have enough land they do so, but if there are students with only 20 to 25 acres of land they go in for service.

30612. Your land is unirrigated, except what you irrigate yourself?—Yes.

30613. What is the gross value of the produce of your land?—I cannot give you the figure.

30614. Can you give me the figure per acre?—As regards rice land, I find that I cannot get more than 5 or 6 *khandis* of paddy per acre.

30615. Can you give the average gross produce per area of 100 or 500 acres?—I cannot give you the exact figure.

30616. How much is a *khandi*?—It is 400 lbs.

30617. You said that you gave 4 *khandis* of seed and took 2 *khandis* of cotton?—Yes.

30618. The seed does not produce only double its amount of cotton. You only want 4 or 5 seers of seed per acre?—5 or 6 seers; that depends on the nature of the soil.

30619. What is the maximum?—6 seers.

30620. How much cotton will one acre of land produce?—One *khandi* if the soil is good enough.

30621. That is how many seers?—14 seers make one maund and 28 maunds make one *khandi*.

30622. You give them 2 *khandis* of seed and take 4 *khandis* of cotton?—No. Suppose I advance two *khandis* of cotton seed; I take in return for my seed one *khandi* of cotton; that is what I mean; that is the practice prevailing in this locality.

30623. You advocate a land mortgage system?—Yes.

30624. You think they have sufficient produce to repay the amount and foreclose the mortgage?—Yes.

30625. With interest at the rate of 9 per cent per annum?—Yes; suppose the land is mortgaged for Rs. 1,000, then they will repay in instalments.

30626. In how many years?—In twenty years; that is what I have suggested.

30627. With interest at 9 per cent?—No; that is too high

30628. What do you advocate then?—6 per cent; they must get it at that rate.

30629. From whom?—From the banks. At present the co-operative banks are advancing money to the societies at the rate of 12 per cent.

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30630. And you say that they should give to the cultivator at the rate of 6 per cent ?—In the case of land mortgage banks the big cultivators are not getting sufficient money from the Central Banks; they must get a sufficient amount at the rate of 6 or 7 per cent.

30631. *Sir Thomas Middleton*: You said that you take an interest in the field work of the department on cotton. What form did that interest take?—I do not follow your question.

30632. You have been watching what the department has been doing in introducing the different varieties of cotton ?—Yes.

30633. Do you think the varieties introduced have been improvements ?—Yes. At present we have got here *roseum* cotton; that is a new variety altogether which was not introduced before.

30634. Do you think that is a good variety ?—It was a good cotton some years ago. But during the last few years of heavy rainfall it is affected by wilt, so the agriculturist hesitates to use that variety.

30635. Are any good varieties of cotton being introduced at present ?—No; there is nothing at present to beat *roseum* cotton. Government are now trying other varieties.

30636. It has not yet come into vogue ?—Of late years, on account of the rainfall the plants are affected by wilt.

30637. You have given us a full account of the working of the Central Provinces and Berar Provincial Co-operative Bank; when was that bank established ?—Three years ago.

30638. Has this system of advancing money on mortgage been long in operation ?—No; I have suggested a new scheme, a land mortgage scheme; we have not introduced it till now.

30639. I am talking about your Akola scheme. You say "the loans are made payable during the course of sixteen years by equal annual instalments of 15¼ per cent ?— Yes.

30640. Now who is the Governor of the Federation to whom the principal is paid ?—Every three years the Governor is changed; in the beginning the Registrar was the Governor; Rao Bahadur Kelkar was the next Governor.

30641. But the money must remain somewhere though the Governors change ?—Yes; it remains with the Governor of the Federation.

30642. The money is invested in the name of the Governor and so there is some profit from that ?—Yes.

30643. 1 per cent is taken by the Akola Bank and 8 per cent goes to the Provincial Bank ?—Yes.

30644. In actual working the Akola Bank finances these transactions on a 1 per cent margin ?—Yes.

30645. What return does the Federation make for the profit it gets ?—They educate the society members.

30646. Propaganda work ?—Yes.

30647. You criticise this scheme yourself because you say: "this 9 per cent rate is payable for all the six years on the original amount and not on the balance outstanding and hence it is excessive" ?—Yes.

30648. This method of repayment must have been carefully thought out. I suppose the object is to get the cultivator to know exactly what amount he has to repay every year ?—Yes; that is generally done because they have got their *khata* and in the *khata* all the repayments are set out. There it is shown that in the first year such an amount with so much interest is taken, in the second year so much and so on.

30649. Why do you think this system is objectionable ?—I do not say the system is objectionable.

30650. But you say: "This 9 per cent rate is payable for all the six years on the original amount and not on the balance outstanding, and hence it is excessive ?—I say the interest is excessive; my complaint generally is about the rate of interest.

30651. If calculated on balances you would require a rate of something like 12 per cent and I do not see that there would be any substantial advantage from the bank's point of view or from the cultivator's ?—Yes.

30652. There is one thing which I do not understand in your note. You yourself are a very enthusiastic co-operator and you are presumably doing all you can to promote these primary credit societies ?—Yes.

30653. And you are also doing a private business in moneylending ?—Yes.

30654. Is it your view that there is a class of business for which the credit society is unsuited and that the private moneylender is better suited than the credit society would be for certain kinds of loans ?—That depends upon the nature of the private individual. If a *sowcar* or a private individual is a good one his customers will be rather pleased with him.

30655. But obviously your view is that however much credit societies may increase in the future there will still be necessity for the private moneylender ?—Yes; without him it is impossible to get on because the Central Banks have not sufficient money to meet the demands of the societies.

30656. It is obviously impossible at present ; but you are such an enthusiastic co-operator that you should think of a time when these societies would meet the whole demand ?—Yes ; the time will come.

30657. That you think will be better than private moneylending ?—Yes.

30658. *Dr. Hyder*: You have just told us that you are a malguzar paying land revenue of about Rs. 5,000 and you carry on this side line of moneylending also. Do you pay income-tax?—Yes.

30659. How much ?—Rs. 2,500.

30660. You said just now that you carry on this side line of moneylending chiefly in the form of advancing seed and you advance the cultivators four *khandis* of cotton seed and recover two *khandis* of cotton ?—Yes.

30661. What is the value in money of this item of four *khandis* of cotton seed ? What was it last year, for instance ?—Last year it was Rs. 20 or Rs. 30 per *khandi* ; but my seed is altogether different.

30662. We shall make proper allowance for the quality of your seed ?—Government sells at the rate of Rs. 50 per *khandi*.

30663. What is the price of your cotton seed per *khandi* ?—You may take it at Rs. 40.

30664. Now you advance four *khandis* of seed and you recover two *khandis* of cotton, do you not ?—Yes.

30665. The price per *khandi* of cotton seed, let us take it at from Rs. 28 to Rs. 40, so that the price of four *khandis* of it would be from Rs. 4×28 to Rs. 4×40. —Yes.

30666. And for this you get in return two *khandis* of cotton ?—Yes.

30667. Now what was the price last year of cotton ?—Rs. 115 per *khandi*.

30668. That is to say you recover Rs. 230 and the advance was Rs. 112 to Rs. 160. And you recover it after how many months?—I am not sure about that whether we shall be able to recover the money or not. But I should say that it would generally be recovered within six or eight months.

30669. What is the interval between the sowing period and the harvesting period ?—Eight months.

30670. Does it not occur to you as a co-operator that this is a profitable business ?—Yes, it does. But we have to keep our *kamdars* and servants and agents and other paraphernalia.

30671. Then I am not wrong in saying that you advance Rs. 112 and recover Rs. 230 ?—No, that is always the case in the moneylending business.

30672. You want education, do you not, in the Central Provinces ?—Yes.

30673. And you want money for research?—Yes.

30674. And I think you also want money for co-operation?—Yes.

30675. Suppose the Central Provinces Government were absolutely bankrupt and these things had to be provided by the Central Provinces Government, what in your opinion would be the best way of raising the funds? Would you levy a tax or a cess?—I do not think that there is any need for taxation at present; I am not in favour of taxation.

30676. Would you not favour the idea of a small addition, say an anna or two, on agricultural incomes?—Already they are heavily overburdened with taxes; I am not in favour of that at all.

30677. You have not given the causes on account of which the people get into debt. I was wondering whether in the Central Provinces the heavy exactions on account of *nazarana* was also not a potent factor? Is that familiar to you?—Yes, we take *nazarana*.

30678. Does the cultivator get into debt because he has to pay heavy *nazarana* and sometimes he might have to part with his land because he is unable to pay *nazarana*?—I have not experienced such cases where on account of *nazarana* they are heavily indebted.

(The witness withdrew.)

Rao Sahib T. S. KORDE, M.L.C., Landlord, Murtizapur, Akola.

Replies to the Questionnaire.

Question 1.—Research.—(*a*) (*i*) India must be split up into groups according to soil and climate. A separate institute should be started for each Province with different branches for different groups. They should go from the traditional known methods and base improvements thereon. India is mainly an agricultural country and has developed that industry since centuries. The soils should be analysed, the deficiencies in each kind be found out and their bearings on the production of crops be suggested to the people. The researches should be practically local and should not be lost sight of. The varying conditions of soil and climate even in one group manifesting differences in the same kind of crop, should be scientifically tried, proved and promulgated.

(*ii*) Medical treatment of animals, as of human beings, has been ancient in India. It is true, that it cannot be explained on modern lines of treatment, but as has now been accepted in the case of human medicines, the old medicines deserve to be brought to a systematic stage. There are often instances, when Veterinary Assistants fail to cure their patients by their elaborate and costly methods, when a man conversant with old and practically free medicines, *e.g.*, herbs, diagnoses and cures the animals marvellously quickly. This is no magic. Herbs, etc., have their powers and some men keeping cattle inherit the knowledge from previous generations. It is no fault of theirs if they have not studied the science, if there was any, but, admittedly there are no books available on it and it has to be explained. For this purpose, all the information of various remedies and methods should be collected, analysed and systematised. Defects found should be made up by the scientific inventions of other schools. This is only an imitation of the system adopted for human beings, as is known in Bengal and Madras Presidencies. I say this, not with a prejudice regarding outside methods, but chiefly in view of the existence of common and cheap methods.

Question 2.—Agricultural Education.—There are no broadcast agricultural schools in the Province. The replies to the questions cannot therefore be given categorically. I confine myself to Berar only. The agriculturist class is admittedly advanced and intelligent and wants only coaching up, in the use of the most refined, up to date and established methods and implements. These must be within the easy reach of an average agriculturist in regard to cost and technical construction and must be tried on the soil and climate and proved to be beneficial to the agriculturist's entire satisfaction, otherwise he will not risk it. The present village schools are, in fact, only educational institutions, more for inspiring educational tendencies than technical ones. Agricultural schools, proper, available for the masses would be too costly to be thought of, at present, but a beginning can be made by confining the teachers to the agricultural class with special training of methods, etc., as referred to above, which methods should be a main factor of the curriculum so as to induce the youth to appreciate it in a practical manner. The local body controlling the school should get advice and help from the Agricultural Department in this respect, as they otherwise do, from Educational Department. The expenditure would not very materially increase. Model agricultural farms, showing the growth of crops of the particular tract under modern methods, which can be within the reach of the ordinary man are being opened at some centres, but very slowly, and not on quite practical lines as mentioned above. They should be improved and spread till there is one at every place of a big bazaar along the main road. The students of agriculture take up the subject, more for service than for agriculture proper, and know the theories without sufficient practical knowledge, experience or use. Practical training means also nature study.

Question 3.—Demonstration and Propaganda.—Demonstration and Propaganda work should be based on the lines indicated above, *i.e.*, applicable to the locality within reach of the ordinary agriculturist's education and purse and after satisfactory trial by the research staff as stated above.

Question 4.—Administration.—(*a*) The department should be Provincial as the questions are more Provincial than Imperial; there should be co-ordination between different Provinces on common subjects and only All-India questions, *e.g.*, transport

facilities, customs, and like these, should remain with the Government of India, whose function should be mainly advisory.

(*b*) No

(*c*) (i) No.

(ii) There should be special facilities and concession rates for the transport of raw produce and fodder.

(iii) Good roads are an old and pressing want of the agriculturists. My views on this point are summarised in my speech on the subject in the Central Provinces Legislative Council, printed on pages 54 to 56, Vol. I, of Council Proceedings of 1924.

4. No research by the Meteorological Department on the reduction in rainfall and its uncertainty is yet known. It should be made a prime necessity and widely and regularly published.

5. A systematic postal service in rural areas is still wanting. The difficulties have been put forth in my speech in the Central Provinces Legislative Council as printed on pages 35 to 40, Volume III, dated 20th November 1922, of the Council Proceedings. Those difficulties have not been materially remedied though my resolution was carried by an overwhelming majority.

6. In these days of rapid mechanical advancement, development of post and telegraph services in the rural area would be decidedly beneficial to the agriculturists who would thereby remain in closer touch with the world.

QUESTION 5.—FINANCE.—Government alone would be in the best position to finance the agriculturists by alloting sufficient sums for *taccavi* with, however, shorter process than the present one and for terms according to needs. The present allotments are far too low and the procedure cumbrous.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) A complete dependence upon rains which are becoming more and more uncertain, the usurious moneylender and the trickeries of the speculator in cotton (which is the main crop of Berar and which is controlled by the world market).

(ii) The main source is the valuable land. *Taccavi* is a small factor and co-operative credit societies being still in their infancy are a very small factor.

(iii) The uncertainty of timely rains, the land-grabbing tendency and trickery of the moneylender, and the rising cost of living and labour.

(*b*) I refer to my speech in the Central Provinces Legislative Council printed in Volume III, No. 6, of the Proceedings of 1923, from pages 368 to 391. There is no restriction upon moneylending in Berar. The rate of interest, for a very sound agriculturist is Rs. 18 per cent per annum, and in the case of the small holders the moneylender manages by his various tricks to double his loan in one season only, *viz.*, by charging 25 per cent for the season only, by selling fodder and seed, in lieu of a part, at a much higher rate than he paid, and eventually contracting to take the produce, in satisfaction of his debt, at a rate much lower than the market rate. Usurious Loans Act is therefore an absolute necessity and the rate of interest must not be more than 6 per cent per annum, which is the maximum that an agriculturist can afford to pay, in case he gets a good crop. The moneylender may invent tricks to baffle the object of that legislation and therefore to bring him round, Government Central Banks on the lines of the small co-operative banks should be started all over. They should ascertain the value of the applicant's land, should advance him a sum to pay off all his liabilities and an additional enough sum, to enable him to stand on his own legs, taking the crop from an average of about ten years. His land should be worth a little more than the sum to be so given to him and it will remain as a mortgage till the debt is paid off. This alone will give life to him and the Government will not lose by charging 6 per cent. This will take some time. To start with, a definite and decent sum of say 50 lakhs of rupees should be earmarked annually, under a special head in the Provincial Budget, for relieving the indebtedness and checking its further progress.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Compact property is decidedly better managed and at a lower cost and trouble, than scattered holdings, and it would be well to make them compact by exchange. Agriculturists, at times, do adopt the principle, but various considerations crop up and they cannot be entirely ignored Usually land is hereditary and carries a sentiment with it; or a piece may have been

acquired after great exertions and fighting, and may have, as such, a special value for the holder. Government, however, do well in offering fair help in such affairs, to persons looking to them. If the system becomes popular and the agriculturists begin to reap the advantages of it, it is bound to progress without any legislation.

QUESTION 8.—IRRIGATION.—(*a*) (i) The whole of Berar, with its rich black soil, is badly wanting in perennial canals. A survey by technical men may be made of the Satpura to North, which has seven rows of mountains with valleys between, and Ajanta to South to find out suitable places for tanks, and canals should be spread throughout Berar, which is a broad valley, opening on the Bombay Presidency. Several deep valleys, with a narrow outlet can be found in the mountains throughout the length of Berar. The soil of Satpura is suspected to be porous, and some chemical method will have to be adopted to make it hard.

(ii) Berar being mainly a plain, tanks and ponds, at a higher level than the land, cannot be put up, except in scattered places and may be constructed to help the main irrigation scheme, but care should be taken to see that they do not get silted up.

(iii) Water level is going down and as was found in some recent trials at Akola and Murtizapur, in boring, there is a hard layer of rock below. It may not however be contiguous and boring was not done sufficiently deep, as is done in America and elsewhere. If such under-currents are traced and caught, the agriculturists will not hesitate to rush to them. A geological survey would be able to do valuable help in this direction.

QUESTION 14.—IMPLEMENTS.—(*b*) Before cultivator can risk his capital, he ought to be convinced of the utility of the machine and in order to so convince him, implements such as iron ploughs, winnowers, fodder-cutters, etc., should be kept at various centres. Demonstrations should also be given at fairs and all other occasions where cultivators come together in large numbers. Costly machines, which are beyond the means of the cultivator to purchase, should be kept at convenient centres, either for free trial or on moderate hire, and with that end in view, agricultural and industrial concerns should be started and encouraged. Persons capable of handling the machines are still few and Government should secure and provide them till local men get sufficient training and experience, otherwise full advantage cannot be taken of such machines.

QUESTION 15.—VETERINARY.—(*a*) Civil Veterinary Department should be under the control of Director of Agriculture and should not be independent.

(*b*) (i) Yes; in some places the system works well.
(ii) No.
(iii) No.

(*c*) (i) Agriculturists do not make full use of the dispensaries mainly because they get their animals treated in their villages by old methods and also because it is too inconvenient to get the sick animal to the dispensary regularly for days. The masses do not, moreover have confidence in the perfection of the treatment, in preference to their old methods, which they mostly find effective and prompt, though to a modern man apparently crude. The improvement in the working is suggested in the answer to Question 1 above.

QUESTION 16.—ANIMAL HUSBANDARY.—(*a*) (ii) Pure milk is a great factor of livelihood and is becoming rare in Berar. Systematic dairies should therefore be started at various centres, at least in all important towns. A private enterprise in this direction should be encouraged by giving all sorts of facilities, *e. g.*, grazing, etc.

(*b*) (iii) Owing to shortage of rain the total quantity of fodder is going down and is becoming insufficient. On the other hand, there are several tracts in the Central Provinces where grass is in abundance and remains uncut. If railway facilities are kept ever open and not confined to famines only, that supply can be made use of to the advantage of both the tracts.

(*c*) April, May, June and July.

(*d*) As per (*b*) (iii) above.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) All the year round the cultivator is busy. In what may be called the slack season, *i.e.*, summer, he is engaged in ploughing, digging out grass, filling holes, putting up embankments, *i.e.*, preparing the ground for sowing. They are called summer operations.

(*d*) Yes.

(*f*) Yes.

R. S. T. S. KORDE.

QUESTION 20.—MARKETING.—No. I refer to cotton and grain markets in Berar. They are governed by a law, which is still ancient and deserves drastic changes which have already been proposed to the Central Provinces Cotton Committee. At present the producer, who has to cart his materials to the market, suffers by the tricks of the more educated and combined class of buyers, brokers, *adtyas* and weighmen, whose violation of the rules ought to be carefully watched and severely dealt with. The process should be so arranged, as to leave no secrecy about rates, which ought to be openly published by the body daily and to see that payments are properly and promptly made. In this connection it may be noted that bad roads seriously deter the sellers from going long distances, where they could get better prices, and have to be content with lower ones, at short distances. Construction and improvement of roads will bring the situation to the proper level. In this connection, I refer to my speech in the Central Provinces Legislative Council published in Volume I, pages 51 to 58 of 1924 Council Proceedings, as also to Volume II, No. 10, pages 681 to 683 of 1922. They will give the difficulties in more details. A reference is also solicited to my speech printed in Berar Legislative Council Proceedings of 17th July 1925, pages 78 to 83.

QUESTION 22.—CO-OPERATION.—In addition to the present co-operative movement, I would recommend Co-operative Agricultural Associations to be brought into existence as they are in other advanced countries like America, Japan, etc. My views on the subject are set forth in my speech in the Central Provinces Legislative Council published in Volume III, No. 4, pages 237 to 239 of Council Proceedings of 1921 and further speeches thereon, published thereafter.

QUESTION 23.—GENERAL EDUCATION.—(*b*) (ii) As a President of District Council, Akola, I have a recent experience of compulsory education in which my Board has taken the lead in Berar. The boys have to attend the school from the age of 6 to 11. They leave school and take to their business as agriculturists or labourers. Gradually they forget entirely what they were taught and the efforts go in vain. The reason is that the curriculum is only theoretical and has no bearing upon their future life, that they might have any practical use of what they learnt. The better course would be to raise the age limit to about fifteen years, when in a couple of years, they would learn the three R's. useful to them. In the present system the District Council is a great loser. The education is free, though a majority of the boys can very well afford to pay normal fees, which, if collected can be used elsewhere.

(iii) Class IV in Primary schools is a stiff door to get through, as this test qualifies a man to be a *patel* and consequently a larger number drops down.

QUESTION 24.—ATTRACTING CAPITAL.—Men of enterprise and capital will be attracted to agriculture only if the indebtedness is removed, the status of agriculturists is further raised, if the rate of interest is brought on a par with normal agricultural income and if the Agricultural Department proceeds on systematic lines as already discussed above.

(*b*) Shortage of funds.

QUESTION 25.—WELFARE OF RURAL POPULATION.—No proper attention is paid to the sanitary condition of rural areas. The inhabitants have to suffer considerably in the rainy season owing to various epidemics. I have set forth the case in my resolution in the Central Provinces Council printed in Volume I, pages 54 to 56 and 58 of Council Proceedings of 1924.

(*b*) Yes. I would earnestly urge to refer to my speech and also other speeches on my resolution in the Central Provinces Legislative Council Proceedings of 11th August 1923, printed in Volume III, No. 6, pages 368 and onwards.

Oral Evidence.

30679. *The Chairman*: Rao Sahib Korde, you are landlord at Murtizapur in the Akola district?—Yes.

30680. You have given the Commission a note of the evidence which you wish to put before us. Would you like at this stage to make a statement or shall I proceed to ask you one or two questions?—I would prefer to answer questions.

30681. Would you tell us the size of your estates?—I own nearly 600 acres of land.

30682. Of that is any part a home farm?—Yes.

30683. How much?—Nearly 400 acres of which 20 acres is a special farm.

30684. And the rest is leased out to tenants?—Yes.

30685. What is the purpose of your special farm?—Conducting experiments.

30686. Do you carry out experiments independently or you are working in consultation with the Agricultural Department?—Yes, I am in consultation with the Agricultural Department, but I am working independently.

30687. What is your main object in carrying out these experiments?—They are experiments in intensive cultivation, to see whether intensive cultivation would be beneficial to the cultivator and to what extent.

30688. Do you find that your tenants are taking any interest in these experiments?—Yes, when they see good results, I am sure they will take an interest in them.

30689. For how long have these experiments been carried out?—For the last five years

30690. Turning to the note you have provided, you say that India must be split into areas according to soil and climate?—Yes.

30691. Would that be independent of provincial boundaries?—Not independent of but within the provincial boundaries.

30692. Then you would have in each Province, according to your scheme, different branches for different groups?—Yes.

30693. That is, different branches for the purpose of research and investigation?—Yes, according to the different crops.

30694. Are you familiar with the working of the Indian Central Cotton Committee?—I am on the Provincial Cotton Committee.

30695. That is part of the Indian Central Cotton Committee, is it not?—Yes.

30696. What do you think of the scheme of organising research and propaganda according to crops?—I do not attach great importance to it in the beginning. At this stage I do not attach much importance to this research.

30697. What do you think of the work of the Indian Central Cotton Committee?—I do not think it is of substantial advantage to the cultivators.

30698. Have you followed its working closely?—Yes. I am following closely the working of the Provincial Cotton Committee.

30699. On the question of agricultural education, many witnesses have told the Commission that one of the principal difficulties in imparting education of an agricultural nature to the general public in the rural areas centres upon the difficulty of discovering and training the right type of the teacher, would you agree with that?—Yes.

30700. Do you think that the present scales of pay are such as to attract the right class of man to the teaching profession?—I do not think the teaching of agriculture is such a difficult task that in order to obtain the people we want we shall have to raise the salaries.

30701. It is merely a question of training the teacher?—Yes. In fact, our country being an agricultural country, each and every teacher ought to be an agriculturist to a certain extent. There ought, however, to be a change in the curriculum.

30702. Have you taken a personal interest in the co-operative movement?—Yes, to a certain extent.

30703. Have you taken active part in that movement?—Yes, to a certain extent.

30704. In what capacity?—I am one of the Directors of the Akola Central Bank and I have organised village societies.

30705. Did that Central Bank pass through something like a crisis recently?—Yes, three or four years ago.

30706. Will you tell the Commission the nature of the crisis?—Want of funds.

30707. What exactly occurred as the result of lack of funds?—Money which was advanced could not be recovered owing to the bad years. Cultivators could not return he money owing to the failure of crops.

30708. How many bad years had you ?—A great many. Very rarely do we have a good year. This is the third bad year we have had in succession. In fact, this year is so bad that it should be called a famine year.

30709. How does it compare with the average of the last twenty years ?—During the last twenty years with the exception of four or five years we have had no good years.

30710. Does that suggest that your standard of excellence is rather high ?—No, I do not think so.

30711. Do you think the bank was well advised in financing its operations on the assumption that any group of years (say the following three) was likely to be better than the average of the past twenty ?—They ought to take into consideration chiefly the difficulties of the cultivators.

30712. Have you any credit societies in your own villages ?—No, not up to now.

30713 How many villages have you ?—In Berar there is no malguzari system. We have got the ryotwari system. I own lands in two or three scattered villages.

30714. Under what system do you own your 600 acres ? Under the ryotwari system ?—Yes.

30715. Do you regard the extension of the co-operative credit movement as the most likely to afford relief to cultivators in the matter of their indebtedness ?—Yes, but it will be a very long time. It will take, probably 40, 50 or even 100 years.

30716. Do you associate cheap credit with the danger of over-borrowing ?—I do not.

30717. Have you any experience of well irrigation ?—Yes, a good deal.

30718. In your own area ?—Yes.

30719. What has been your experience ?—Owing to the shortage of rainfall and scarcity of water, I have had to spend nearly 22,000 rupees for digging wells over an area of 20 acres.

30720. What has been the result ?—I have not got sufficient water.

30721. Were accurate surveys available to you before you dug these wells ?—Yes, I took every precaution before the wells were dug.

30722. At what depth did you find water ?—35 to 40 feet. We got water, but we did not get sufficient water. I wanted to irrigate the whole plot of 20 acres.

30723. What system of lift did you employ ?—I tried every system, the centrifugal pump, the wheel system and also *mote* and so on.

30724. Are you the President of the District Council at Akola now ?—Yes.

30725. Do you think that body has got sufficient funds to discharge its duties ? Has it sufficient money to carry out necessary work ?—No.

30726. Is there a public demand for increased educational facilities ?—Yes, it is tremendous.

30727. And also for better roads ?—Yes, there is a growing demand.

30728. Which comes first in the public estimation ?—I should say both.

30729. You think it is a dead heat ?—Yes.

30730. What do you think about the system of handing over the administration of the Veterinary Service to the local bodies; do you approve of it ?—Yes.

30731. You think that has been a success ?—Yes.

30732. In this matter of attracting men of enterprise and capital to agriculture, do you think that the small size of the holdings is a serious bar to such men taking up agriculture ?—That is not applicable to the case of Berar; in certain parts of the Central Provinces that is the case; it is applicable to Chhattisgarh.

30733. Otherwise, there is ample land ?—Yes.

30734. Still under forest; is that the point ?—We have got enough big plots.

30735. There is enough cultivated land ?—Yes.

30736. *Sir Henry Lawrence*: Your Local Board has not got enough revenue?—There are outstanding demands; if we had more funds, they could be utilised. We have now to restrict our expenditure.

30737. What cess is levied for the purpose of the Local Boards?—We charge 18 pies per rupee of the land revenue, chiefly for educational purposes.

30738. Have you increased that cess in recent years?—Yes, from 12 pies to 18 pies.

30739. In what year?—Three or four years ago.

30740. Under your new Local Self-Government Act?—Yes, after that.

30741. Can you raise it any more?—No.

30742. The law does not allow you to raise it?—We cannot raise it, looking to the circumstances of the public; they cannot bear any further taxation.

30743. The people are not prepared to pay any more?—No; not only that but they are unwilling to pay even 18 pies, which is considered very heavy.

30744. They consider that too heavy?—Yes.

30745. How much extra revenue did this additional 6 pies bring you?—In all we got about Rs. 3 lakhs; the additional revenue must be about Rs. 1 lakh.

30746. To what have you applied this extra lakh of rupees which you have recently obtained?—Almost all to education.

30747. Not on roads?—The district funds do not permit of any substantial sums being spent on the improvement of the roads. However, my District Council is trying its best, but others are not doing so. For the last three years we are spending Rs. 30,000 for the improvement of the fair weather roads, but that is practically nothing. Government must take up the improvement of the fair weather roads.

30748. How much, do you estimate, is necessary for expenditure on these fair weather roads?—Unless a regular survey is taken it cannot be said what the expenditure will be, because at some places they will require a good deal of expenditure, and at other places they may cost less. In places where there are *nullahs* and inconvenient places, the expenditure will be more, but where it is flat land it will be less.

30749. Is any money from provincial revenue spent on the Local Board roads? Do you get any subventions?—For Local Board roads we do not get anything.

30750. You get no subventions?—Some roads have been transferred to the District Council for maintenance, and we incur some charges for that. We do not get any subventions for the improvement of the Local Board roads; we have been crying for the last so many years for the improvement of these fair weather roads, but Government has not paid any attention to it till now.

30751. You say that you spent Rs 22,000 on trying to get water for 20 acres?—Yes, sufficient water.

30752. How many wells did you sink?—Four.

30753. Each cost you Rs. 5,000?—One well cost me nearly Rs. 11,000 and and remaining 3 Rs. 11,000.

30754. How did you ascertain the site on which to dig?—Did you call in a water finder?—There are some of these village water finders; they can point out the site.

30755. Are they reliable in their advice?—So the people say, but I preferred my own sites. I looked to the low level of the ground and other favourable signs and selected the sites.

30756. You selected the sites yourself, on your own judgment?—Yes.

30757. On your 600 acres, do you levy cash rents from your tenants or do you share the produce?—For the last ten years I have been levying cash rents on some fields and on others I share the produce; it is called *batai*.

30758. What is your principal crop? Is it cotton?—Cotton, wheat, *juar* and so many other crops; but for the last twenty years there being scarcity and uncertainty of rainfall, we cannot take the risk of reserving our land for *rabi* crops which require a greater amount of rainfall.

30759. You chiefly grow cotton?—Yes, cotton and *juar*.

30760. How much per acre do your cash rents amount to as a rule?—I cannot give any round figure. This year the rent value has gone very high; it all depends on the rates prevalent in the market.

30761. Can you give me the figure?—It varies from Rs. 5 to Rs. 15 or, at the most, Rs. 20 per acre.

30762. What is the land revenue which you pay on an acre of such land?—Rs. 2 to Rs. 3.

30763. *Sir Ganga Ram*: Do you always take from your tenants cash rent, or do you also participate in share of the produce?—Not always; sometimes we get cash rents and sometimes we do not.

30764. When you participate in kind, what share do you get?—It depends on the quality of the soil; you may get one-third or even less.

30765. Were the wells that you sunk *pucca* masonry wells or were they *kutcha* wells?—They were *pucca* wells.

30766. Made of brick?—Yes, brick and lime.

30767. Were they circular or rectangular?—One big well that I have built is square.

30768. Why did you make it square?—Because I wanted to have a way to go in for which a staircase was necessary; I thought it was preferable to a round well.

30769. Were you asked by any engineer to do that?—No.

30770. Besides your income from the land, do you do any moneylending?—No. The chief source of my income is land.

30771. Are you a member of the Legislative Council?—Yes.

30772. Which party do you belong to?—I belong to the Nationalist party.

30773. What kind of soil have you got?—We have got different kinds of land in Berar.

30774. What crops do you grow?—I grow all sorts of crops, cotton, *juar*, pulses, etc.

30775. Do you grow any garden crops?—Yes.

30776. May I ask you what your income from 600 acres is?—At times it is a *minus* figure, in bad years; especially during the last two years, we could not realise even what we had spent on agriculture.

30777. You said there was difficulty in the Central Bank for want of funds; did you mean want of deposits?—Yes.

30778. Their chief source of income is deposits?—They borrow from the Provincial Bank.

30779. They do not get any deposits?—There are some deposits, but deposits are not the chief source.

30780. What do you mean by fair weather roads?—They are village roads.

30781. Are they on the same level as the ground?—Not on the ground level; almost all these roads have been sunk.

30782. Do you want to bring them to the ground level?—Yes, we want money for that; we are not ambitious to make all these roads *pucca* roads.

30783. Can you say how much it would cost per mile?—It would require from Rs. 500 to Rs. 1,000 per mile; that would not be the cost for the whole length of the road, but only at some places.

30784. You have no land irrigated from tanks?—No.

30785. And this tax of 18 pies per rupee of land revenue was intended for irrigation?—No, for education.

30786. They do not spend it on education?—They do; they spend even more than that; nearly half the income is spent on education.

30787. What education do you mean? Is it rural education?—Rural and urban education is the same thing; there is no difference. We are concerned with primary education.

30788. Primary education for the agriculturists?—All boys receive it.

30789. It is not intended for the boys of agriculturists alone?—There is no distinction made between agriculturist boys and other boys. More than 80 per cent of the population is agricultural; it is not barred for boys of other classes.

30790. *Sir Thomas Middleton*: You are chiefly interested in the cotton crop in your district?—We are interested in all the crops.

30791. Is not the cotton crop the most important?—This crop was popular for some years because it was fetching a better price, but now we have learnt a good lesson and we go in for other crops. This year, the area under cotton has gone down, and next year it will go down still further.

30792. The last witness told us that the cotton that you had in the district was becoming less popular, because it was suffering from disease?—It is not chiefly because of disease; of course, it does suffer from disease.

30793. What kind of cotton do you grow in your district?—Generally, till now, *roseum* cotton was popular.

30794. Do you think that *roseum* is as healthy as it used to be?—They say so. Though every year I am sowing that cotton, I have not kept separate accounts to compare the yield of *roseum* cotton with that of other varieties, but I have heard people say that *roseum* cotton yields more.

30795. You have had no complaints about it in your district?—The complaint is that it does not fetch good prices; there is no demand.

30796. That is because of the quality?—It is short staple cotton; we want a long staple variety which will suit the climatic and soil conditions of your Province.

30797. Can you grow long staple cotton in your district?—I made trials with it for a couple of years, but I had to give it up.

30798. Have not your neighbours always cultivated short staple cotton?—Formerly, they were growing long staple cotton, but it requires more rainfall.

30799. When you say formerly, how long ago?—About 30 years ago.

30800. I think you said you would like every teacher in the primary schools to be something of an agriculturist?—90 per cent of them are agriculturist teachers coming from the agricultural class; they need not be taught any scientific knowledge of agriculture.

30801. What are they paid in your district?—From Rs. 22 to Rs. 60 or Rs. 75.

30802. You are a Director of the Akola Bank. The fact that the Bank got into some difficulty two or three years ago has been mentioned; you pointed out that that was due to bad seasons?—Yes, bad seasons and the difficulties of the agriculturists.

30803. Any bank that lends money mainly to agriculturists must expect such bad seasons; what steps did you take to accumulate a reserve fund?—I was not on the managing board.

30804. Not at that time?—Nor am I now on the managing board.

30805. You spoke of irrigating 20 acres from four wells?—Yes.

30806. Were those 20 acres all in one block?—Yes.

30807. Do you not think that 5 acres irrigation from one well is a very large amount to expect in Berar?—We can irrigate up to 4 acres with one well provided it had a good supply of water, but with these 4 wells at the present time I cannot irrigate more than 7 or 8 acres.

30808. About 2 acres a well?—Yes, and during the hot season I cannot produce any crops.

30809. *Dr. Hyder*: You recommend this indigenous system of treating animals; have you much faith in the Indian veterinary people who practice Indian methods, the old system?—Yes, I have.

30810. Do you not think there is a danger of quackery?—I have known many cases and find the percentage of quackery is so small as not to be dangerous; it is worth trying.

30811. You have said that the village roads are not in good condition; what is the width of a village road?—1 chain, that is, 33 ft.

30812. Is that the standard width?—Yes.

30813. So that carts laden with cotton can pass easily?—No, they cannot; that is not owing to the width but because the roads are sunk so that carts cannot pass each other.

30814. You mean that these roads have sunk below the surrounding level?—Yes.

30815. There are ruts?—Yes.

30816. So that there is difficulty in the transportation of cotton by carts to the markets; is that your view?—Yes, they cannot get along easily; it takes them 24 hours to cover a distance of 20 miles sometimes.

30817. These village roads are maintained by your *Mahars*, are they not?—No. It was formerly one of the duties of the *Mahars* to do the necessary small repairs after the rainy season when the roads were impassable.

30818. Why did you abolish the *baluta* system?—I am not responsible for that; on the contrary, I was in favour of the *baluta* system; we shall have to return to that system.

30819. *Sir Henry Lawrence*: When was it abolished?—Three or four years ago.

30820. *Dr. Hyder*: How does the cotton grower fare when he gets to the cotton market?—He certainly does not receive fair treatment.

30821. Of what do you complain?—Of everything.

30822. Well, mention some things of which you complain?—I should have to draw a picture of it; one cannot imagine it unless one is cognisant of it and actually sees what happens. This is the actual state of affairs: the villagers take their carts to the cotton markets I am talking with regard to Berar only. There are very few cotton markets in Berar. Some villagers have to take their carts to a cotton market as far distant as 40, 50 or even 60 miles. The system in the cotton markets is that there are these licensed brokers, *adtyas*, weighmen, and some purchasers. The carts are sold through these brokers. In 70 or 80 per cent of the cases the brokers and *adtyas* are the same persons. They take charges for brokerage and also as *adtyas*; it is a very heavy burden on the sellers. It is not compulsory on the seller to sell his cotton through these brokers and *adtyas*, but being quite ignorant and illiterate and not knowing the prevailing rates, or being acquainted with the purchasers, he has to employ their agency. Generally there are 100, 150 or 200 of these brokers attached to big cotton markets such as Amraoti and Akola. No sooner does his cart get to the gates of the cotton market than 50, 60 or 100 of these brokers surround him; some catchhold of the nose-string of his bullock, some his turban and some his coat, and they pester him in order to get his agency.

30823. He is apparently a much sought-after man, and therefore he should be in a much stronger position?—The poor fellow being alone on the cart, what can he do? If he decides to employ a particular broker, then his cart is taken into the cotton market. I may point out to you that the law as to these cotton and grain markets is most defective, and there are all sorts of malpractices in the market. His cart is taken into the cotton market. The broker, who is generally mixed up with these sellers, goes and settles the rate secretly; he does it by some signs under a cloth taking up a handkerchief and moving his fingers. In that way they settle the rate at so many rupees a *khandi*. The grower is then told that the rate is Rs. 80 or Rs. 90 per *khandi*, or whatever it is. If a particular broker has had 100 carts come to him that day, he tells the clerk of the cotton market that he has 100 carts and those carts are entered in that broker's name though he is not the actual grower. It is entered as being 100 carts sold by "A" to "B", and the receipts are handed over to the broker who then goes to a ginning factory. The price is then settled at some flat rate, and the cart is taken to the ginning factory. I may point out that all these cotton markets in Berar depend on the Bombay market which depends on the markets of America and England, so that 10 times a day telegrams are received giving the Bomaby rate. Though the cotton crop only comes once a year, the rates change as much as 100 times in a day. If the rate is fixed for a particular cart at Rs. 100, and the purchaser

then receives a telegram from Bombay telling him that the Bombay rate has gone down, he will find out ways of slipping out of his bargain: one or two weighments of the cotton are taken and then the purchaser will point out that the cotton is damp or has some other fault. Then the grower has to reduce his price though the rate may have been already practically settled.

30824. Do you mean to say that contracts once entered into are broken?—Yes, that is the case everywhere. There are also the trickeries of the weighmen; they take more cotton than they are weighing on the hand scale. The grower is an illiterate person and while he is busy watching that others do not steal his cotton, the weighman counts falsely. If the grower goes to some market authority and complains that his cart has already been sold at a higher price than he is now offered, it is found that he has no evidence, he has no record of the transaction entered in the registar of the cotton market, though he has to pay the market fee. The broker has become the owner of the cotton, because a certain number of carts is entered in his name, and therefore the grower cannot make any complaint. The law ought to be drastically amended as soon as possible.

30825 Can you suggest any drastic changes?—Yes, I have suggested the changes in detail to the Central Provinces Cotton Committee; a draft Bill is ready and I think it will be passed by the Board soon.

30826. Do you think that draft Bill will amend these defects?—Yes, all these evils of weighmen, brokers and middlemen. If I go to market and sell a cart of cotton, the buyer should pay me the full amount; why should I pay these charges?

30827. There is a disparity as regards intelligence and education between these two people; the cultivator knows nothing while these other gentlemen know all the tricks of the trade?—Yes. There should be a majority of sellers on the Market Committee.

30828. With regard to postal facilities, if I were to post in Akola a letter to a village how many days would it take for that letter to be delivered at its destination?—From 8 to 15 days; that is actully the state of things; I have moved a resolution in the Council asking that the Local Government should recommend to the Central Government that this should be remedied. The system is generally this: The Post Office has a village peon who comes to the Post Office and takes the letters once a week. He takes a round in those villages and then returns on the next bazaar day. Then suppose, after he goes to the Post Office on the next day, a letter comes addressed to somebody else in the village, he goes to the village next week taking that letter with him.

30829. *Dr. Hyder*: But what was the good of moving a resolution in this Council? You know the Post Office is not a provincial subject?—I know it and that is why I asked the Local Government to move the Imperial Government in the matter.

30830. *The Raja of Parlakimedi*: You say that it will be better if the Veterinary Department also takes up the study and teaching of indigenous methods. But is it not a fact that many people with a so-called knowledge of indigenous treatment will not come forward to reveal their respective remedies?—We have to so arrange that thay will come and supply us that information.

30831. Who is to undertake that business?—The State, the Government.

30832. Do you not think that it is a work to be done by the public? It is beyond the scope of the public or of private individuals.

30833. Even to collect information?—Government may take the help of the public if necessary; that is a different question altogether. It is not a question of a few months or a year or two; it would take many years.

30834. Do you not think that before approaching the Government it would be better that some public spirited gentlemen should go about and gather information and place it in the hands of the Government?—That is not feasible.

30835. You say that Government should take it up?—Yes.

30836. From your personal knowledge could you say whether the indigenous method of treatment is better than the method adopted by the Veterinary Department?—Yes; I will give one instance which occurred last month. The leg of an ox was dislocated and it was taken to the veterinary dispensary. The

veterinary doctor attended to it for 10 days but could not cure it and he asked the owner to leave it with him for another fortnight. Meanwhile one of the relatives of the owner came to know of this and he said he would take it to a man near by who would cure it in no time. Accordingly the ox was taken there and the man gave it some strokes with a big rod at some particular point and the ox was all right in a few hours.

30837. Did it not make matters worse?—No.

30838. Did you verify that personally or is it mere hearsay?—I saw it with my own eyes.

30839. Personally I would not like to entrust my bulls to such treatment?—May be.

30840. You suggest that in Berar there is dearth of irrigation and irrigation works should be undertaken?—Yes.

30841. Is it popular?—Yes.

30842. Has it been taken up in a manner that the Government feels that the people really want such a thing?—Yes; it has been represented and brought to the notice of the Government in this very hall in the Central Provinces Council more than once.

30843. By a few representatives?—But they represent the whole public.

30844. Did they represent what the people wanted actually?—Yes, they did not move the resolution of their own accord; there was a demand for such a thing.

30845. Can the Commission understand that the people of that area are willing to enter into an agreement with Government and take advantage of such irrigation works?—They know the terms of the agreement; we have discussed that question in the Provincial Board of Agriculture too.

30846. I suppose you might have heard that in other parts of this Province there are potential irrigation facilities and it is the people that are not willing to take advantage of such things?—Such circumstances do not exist in our part of the Province. But the trouble is that a few of them require water and the others do not; not only that, there is a dearth of drinking water; that is the main difficulty.

30847. Does not that area have any District or Local Board?—But what can they do? They cannot take up such costly schemes.

30848. Can they not create facilities for drinking water, by digging wells and the like?—No; they cannot incur such large expenditure all over the Province, but they try their level best.

30849. Are they trying?—Yes.

30850. How many wells do these local bodies and District Boards possess now?—I cannot give the exact number; but they may have about 75.

30851. Do you know the amount that the Local Board lays aside for such works?—My Board gives Rs. 5,000 to Rs. 7,000.

30852. For the whole of Berar?—Yes; for the four districts of Berar.

30853. Is it an accurate figure?—How can I give accurate figures for all the Local Boards?

30854. As regards agricultural indebtedness, does the practice of lending grain in kind exist in this Province?—Yes, in some parts.

30855. In such cases what is the rate of interest charged?—It is terrible; they take *sawai* for three months, that is 1¼ times. As the previous witness has said they give 4 *khandis* of cotton seed and take back 2 *khandis* of cotton; that is for a few months only.

30856. Is that a universal practice in this Province?—Not universal; it exists in some parts.

30857. Both the interest and the principal are calculated at the time of the harvest?—Yes.

30858. Then as regards fragmentation of holdings you suggest: "Government, however, do well in offering fair help in such affairs to persons looking to them". What do you mean by that?—Government has taken up this question of consolidation of holdings and they are trying their best wherever possible.

30859. Are Government acquiring land?—No; they are making both parties agree; efforts are being made in that direction in our Province.

30860. When a man has to part with land, what compensation does he get?—It depends on the nature of the soil.

30861. But what is the usual practice?—There is no usual practice; we have not come to that stage yet.

30862. *Sir S. M. Chitnavis*: No consolidation is going on in Berar?—No; I am referring to the Chhattisgarh district.

30863. *The Raja of Parlakimedi*: Whenever exchange of lands takes place, what is the practice adopted?—That practice is not prevalent in Berar; we have got bigger plots.

30864. *Mr. Kamat*: You make some suggestions with regard to agricultural indebtedness. You say in the first place that the moneylender manages by his various tricks to double his loan in one season only. Can you explain how that occurs?—The previous witness has cleared that point, I think.

30865. I want you to give us an instance of how it is possible?—For the season time only, that is for three months, the moneylender gives money on *sawai*.

30866. You are referring to loans in kind and not to cash loans?—Cash loans too.

30867. Please explain how a cash loan of Rs. 100 is doubled in one season?—In three months he can recover 25 per cent; so in one year it become double the amount at that proportion.

30868. In three months he gets Rs. 125 for Rs. 100?—Yes.

30869. In the remaining nine months what does he get?—If we are to apply that proportion in one year, it is double.

30870. Your remedy to cures this evil is the Usurious Loans Act, which you say is an absolute necessity?—My chief remedy would be that the State must come forward

30871. But you suggest that there should be restriction of interest and the rate to be fixed should be 6 per cent per annum?—Yes.

30872. Your moneylenders would not come forward at that rate if that were to be fixed as the maximum rate?—They will, when the Government or the State take it into their hands and relieve the agriculturists of their indebtedness.

30873. They will offer to lend money at 6 per cent?—Even at less than that.

30874. Pending that period when the Government will take it over you suggest that the State should support the Central Banks?—My first remedy is that the State should come forward and earmark a big amount not less than Rs. 50,00,000 every year in the provincial budget, which should be distributed to the agriculturists who are in indigent circumstances.

30875. Then again efforts should be made to expand the credit societies also?—No, the Government should advance the loans direct to the agriculturists just as they do in the case of *taccavi* loans. Before that my point is that a survey of the indebtedness of the agriculturists should be taken and the figure that would be required should be ascertained.

30876. After taking an economic survey of indebtedness, you want Government to earmark Rs. 50,00,000 per year to be given direct to the agriculturists at not more than 6 per cent interest?—Yes, because the agriculturist cannot realise more than 6 per cent interest from his cultivation.

30877. Where would the place of the co-operative movement be if Government were to give direct loans to the agriculturists according to your system?—Credit societies cannot cope with the demand at present. I have suggested that remedy and after that the co-operative credit societies should take it into their own hands.

30878. Do I understand you to mean that until Government carries on this system of yours of earmarking Rs. 50,00,000 and advancing it direct to the agriculturists you suggest there should be neither the moneylender nor the co-operative

societies in the rural economics of the country?—No, I do not say that. The Government could immediately come forward and help the agriculturists at this particular stage.

30879. Talking about irrigation, you say that the soil of Satpura is suspected to be porous and some chemical method will have to be adopted to make it hard. What is it that you have in mind?—I have raised this question because I may get the reply that the soil of Satpura is porous. Anticipating that reply I have already suggested that even if it be porous, some chemical means should be found out and it should be made impermeable.

30880. Speaking about general education you suggest that education is free, though a majority of the boys can very well afford to pay normal fees, which, if collected, can be used elsewhere. Are you against free education?—Certainly not.

30881. Then what is the point of your suggestion? You say if fees were to be collected they could be used elsewhere?—Because the present practice is that wherever compulsory education is started, the District Councils do not get these fees. Some percentage should be realised. Parents of some boys are in a position to pay the fees but they too are exempted. And besides, the school-going age is fixed at between 6 and 11.

30882. That is quite another point. You are not wholly, I take it, in favour of free education?—I am in favour of free and compulsory education. But the age limit should be extended to 15.

30883. That I say is quite a different point. If you are, as you say, in favour of free education you cannot levy fees? Even if the father of the boy is well-to-do, you cannot levy a fee if you say you are in favour of free educatiou?—Yes, I see the point but even so I am in favour of free education.

30884. You say that there should be special facilities and concession rates for the transport of raw produce and fodder. Have you studied the present rates of the railways, whether they are earning or losing?—No.

30885. You want a general lowering for all agricultural produce?—Yes, they extended this concession in the days of scarcity.

30886. You said this was a famine year for the cotton growers; you are a cotton grower; are all cotton growers famine-stricken?—I cannot say from village to village but the majority of them are.

30887. Do you mean to say that cotton growing shows a deficit?—Certainly.

30888. Can you give me the figures of the cost of production per acre of cotton and what price you have realised this year? What is the present rate of cotton. Is it Rs. 100 a *khandi* or Rs. 85?—Taking the standard of Rs. 80 per *khandi* of 28 maunds this year some fields could not yield more than 2 maunds or 3 maunds per acre.

30889. The production was 3 maunds per acre? And how much was the cost including labour and everything else? You gave me the outturn and its cost?—No I did not give the cost. I am taking some particular cases, and not cases in general. I think the cost is Rs 15.

30890. You stated this was a year of famine for all cotton growers?—But I did not say cent per cent.

30891. Even taking the worst cases, supposing the average outturn was equivalent in rupees to say Rs 20?—No, taking the value of 3 maunds it comes not to Rs. 20 but to Rs. 9 or Rs. 10 *i. e*, 28 maunds per *khandi* fetch Rs. 85.

30892. *Sir Ganga Ram:* Rs. 3 per maund of cotton?—Yes.

30893. *Sir Henry Lawrence:* What is a maund?—It is 28 lbs.

30894. *Mr. Kamat:* You say that throughout the Berar, on an average, the cost of the cotton produced per acre would be about Rs. 20 or even less?—No, it would be Rs. 10 to Rs. 15.

30895. What would be the cost of production, cost of ploughing, labour, etc.?—I said Rs. 10 to Rs. 15 would bo the cost of production; this includes labour, weeding expenses, etc.

30896. You realise Rs. 10 as the value of the outturn and you think the loss has been Rs. 5 per acre?—I am not giving the average figure. In some cases it varies according to the fields and according to the situation.

30897. If that is the case, in the majority of cases there is no famine?—Yes.

30898. Give me at least the worst case and the best case?—For a good crop this year, 4 acres will yield one *khandi* the value of which will be Rs. 80 or Rs. 85.

30899. What about the cost of labour?—This year the labour charges are very high and he will have to spend about Rs. 100. He cannot recover even what he has spent.

30900. Then the man who realises Rs. 85 has to spend Rs. 100?—Yes.

30901. He is therefore losing to the extent of Rs. 15?—Yes.

30902. *Sir Ganga Ram*: How much yield did you get last year from *roseum* cotton?—For the last four or five years we have not had good crops.

30903. I want to know how many maunds you get per acre with *roseum* cotton?—A bumper crop in a good year would yield one *khandi* per acre, or 20 maunds per acre.

30904. This year it has not been anything like that?—No, it has been 2, 3 or 5.

30905. Can you give any reason for that?—Has the seed deteriorated?—No, it is due to the shortage of rainfall My request to the Commission is that efforts should be directed to the regulation of the rainfall which is most uncertain.

30906. God alone can do that?—If the rainfall could be regulated, very many difficulties would be removed yet.

30907. Yet you are aspiring to grow long staple cotton, which can be sown only in April?—Our first need is to have a good crop with short cotton; after that we might aspire to the long cotton.

(The witness withdrew.)

Mr. C. W. WILSON., M.R.C.V.S., I.V.S., Veterinary Adviser to Government, Central Provinces.

Replies to the Questionnaire.

QUESTION I.—RESEARCH.—(*a*) (ii) The Imperial Laboratory at Muktesar and the branch at Bareilly are our Research Institutions and are under the control of the Central Government. The Muktesar Institute was started for the purpose of the manufacture of sera and vaccines, particularly for anti-rinderpest serum as the hill cattle in that locality were highly susceptible to that disease. During the last twenty years it has expanded enormously and, in addition to an increase in the amount of sera turned out yearly, research work has been conducted and investigation into the common diseases affecting equines and bovines in this country. Very valuable results of their researches have been afforded by the various workers there not only to the provincial departments in India but to the profession generally throughout the world. The laboratories were extensively used by the investigators into foot-and-mouth disease who were deputed by the Home Government when the seriousness of that disease was beginning to be realised by the British public. The most up-to-date equipment for serum manufacture and research work has been introduced and judging by results it appears that the organisation of veterinary research work in the Muktesar Institution compares favourably with similar institutions in other countries. The administration seems to have suffered by reason of the short tenure of office held by Directors and research workers. After a few years and even less they have usually obtained other appointments. The system of direct appointment has been unpopular, and it is generally conceded by officers of the department that the administrative control of the laboratory should be placed under a senior officer having experience of provincial work. If a Veterinary Adviser to the Government of India were appointed then he would be the most suitable man for the post. Such an arrangement would leave research workers free from outside duties and would give them the advantages of direction in the investigation of disease of animals requiring immediate attention. The Institution makes a profit by sale of sera, vaccines, etc., and whatever surplus money stands to its credit should be spent on additional facilities for research work. The position of the place is suitable for the manufacture of sera and vaccines as the staff can work comfortably throughout the year but it is not equally suitable for research work owing to its elevation. It is thought that a research institution would be more advantageously placed where general conditions are the same as those affecting the animals under observation. We cannot expect Muktesar to conduct investigation into all the problems requiring solution, so it is expedient for provincial departments to have the means at their disposal for working out those problems affecting them particularly.

(*b*) As no research officers have been appointed in this Province, no particulars can be supplied.

QUESTION 15.—VETERINARY.—(*a*) The Veterinary Department was at one time controlled by the Director of Agriculture though it is now under separate expert management. It should remain independent.

(*b*) (i) Veterinary dispensaries in the Central Provinces and Berar are divided into three classes, *viz.*:—

(1) Provincial.
(2) Local Fund.
(3) Private.

Class (1) dispensaries are maintained by provincial funds and are entirely under Government management. Class (2) comprises dispensaries under Government supervision but maintained partly by local funds and partly by Government. Class (3) institutions are maintained entirely at the cost of Court of Wards, Indian States and certain local bodies under their own management. The system of class (2) dispensaries would work much better if more interest were taken in these institutions by Local Board members.

(ii) No.

(iii) Only partially. Local Board members would probably take no interest in these dispensaries if they ceased to have any hand in the management of them. They should be encouraged to take interest in them.

(*c*) (i) No.

By stimulating propaganda and by giving demonstrations at cattle shows, fairs and markets. The propaganda must be in the hands of professional men as they would be required to give practical demonstrations of operations in addition to lectures. In rural tracts propaganda by means of cinema films and lantern would be advantageous.

(ii) Yes. The services of peripatetic Veterinary Assistant Surgeons are used largely by malguzars but not fully by the cultivator class in those tracts where cattle are of little value. It is the most important branch of the department's duties as the touring Assistant Surgeons are brought into close association with the ryots.

(*d*) The religious scruples of the Hindus in so far as they affect cattle are subtle and intimate and so closely interwoven with the home life of the people professing this religion that it would be well nigh impossible to introduce any form of legislation of the nature of a "Diseases of Animals Act" providing measures for the destruction of the sick cattle, segregation, and control over movements of cattle as obtain in other countries. Existing conditions can best be improved by education. Animal hygiene might be included amongst subjects taught in elementary schools.

(*e*) In bad years the demand for serum is very heavy and sometimes difficulty in securing sufficient quantity is felt. Considering the enormous demand for anti-rinderpest serum at times and the difficulties in transport, it is surprising how efficiently Provinces are served. The railways might grant special facilities for this commodity.

(*f*) Obstacles are mainly religious scruples. Suspicion as to the nature and process of manufacture of sera and vaccines remains. No fees are charged for any work done in connection with agricultural cattle.

(*g*) Yes.

(i) For many years in my Annual Reports to Government on the work of the department, the necessity for the setting up of a Provincial Veterinary Research Institution has been stressed. The scheme is at present under the consideration of Government.

(*h*) By research officers in the Province. Research scholarships could be awarded to young graduates by Government. These scholars when employed in provincial research institutions would be competent to train the graduates of Indian colleges.

(i) Yes.

(1) Co-ordination of veterinary matters in the Provinces and States.

(2) To deal with matters of a central nature.

(3) To advise Government of India on export and import of cattle.

(4) To scrutinise programmes of research work at Muktesar and provincial research institutions and thus prevent overlapping,

(5) To relieve scientific workers of administrative duties now interfering with their legitimate work.

Oral Evidence.

30908. *The Chairman*: Mr. Wilson, you are Veterinary Adviser to the Government of the Central Provinces?—Yes.

30909. You have provided the Commission with a note of the evidence which you wish to put before us. Do you wish to make, at this stage, any statement of a general nature?—Yes, I would like to say a few words. The veterinary officer in charge of a Province should have complete control of the veterinary staff dealing with control of contagious diseases of animals, so that he can give effect to his policy in regard to these after obtaining the sanction of Government. This means the abolition of dual control (District Board Control) in those Provinces where it now exists. Apart from the mutual reporting of contagious diseases scheduled under the Glanders and Farcy Act there is little co-ordination in veterinary work of Provinces and Indian States. It does not seem judicious for this department to be isolated because it happens to be a Transferred subject in a self-governing Province. The work of the Provincial Governments in the control of contagious diseases of animals should be co-ordinated by a central head with the Government of India. He would be the Veterinary Adviser to the Government of India. This officer would visit the Provinces and advise as to the improvement and co-ordination of work for the benefit of the Province and for the good of India as a whole. Without systematic and sustained effort, contagious diseases of animals in India can never be brought under control.

30910. Before you proceed further, I would like to clear up one or two points. You say that you should have complete control over the veterinary officers in the Province?—Yes.

30911. You suggest that the veterinary officers working under local authorities should cease to be under them. You refer to the Veterinary Assistants under the Local Boards?—They should be controlled by the provincial officers and the District Boards should have a part in the management of the dispensaries.

30912. Would that involve any change in the present system?—Not in this Province, but in some Provinces it might.

30913. Will you continue your remarks?—With regard to education, at a Conference of Veterinary Officers in 1923 it was resolved that a Board of Veterinary Studies should be constituted. This Board would be authorised to make modifications and additions to the course from time to time in consideration of the needs of the several Provinces. I consider the constitution of this Board of Veterinary Studies an urgent matter. In Chapter XV, paragraph 134, page 49 of the *Memorandum on Rural Conditions and Agricultural Development* the statement regarding a research institute being under the consideration of Government is somewhat misleading. Very limited accommodation only is provided for this department in the Agricultural Research Institute at Nagpur. A separate Veterinary Research Institute is required with wards for animals under observation. The close connection between the problems of public health and those of the Veterinary Department is inclined to be overlooked. In my opinion the public health and Veterinary research laboratories should be housed in the same building. I think the problems connected with human tuberculosis, for example, would stand a better chance of solution were the medical and veterinary research officers working hand in hand. Although the Agriculture and Veterinary Departments are under separate direction they have always worked together amicably. A Veterinary Inspector's services are lent for the better control of cattle diseases occurring in the Nagpur College and Telinkheri farms and this man also lectures to the Agricultural College students on Veterinary subjects and gives practical demonstrations in Veterinary first aid. The Veterinary Assistant Surgeon in charge of the Nagpur Veterinary Hospital also delivers lectures to the students. The Government agricultural farms where cattle-breeding is conducted are regularly inspected by gazetted and subordinate officers of the department and timely assistance is given by them whenever their services are required. The sterilisation of scrub bulls must have a beneficent effect and considerably facilitate the success of cattle-breeding operations.

30914. Would you give us an account of your own training and past posts in India?—Originally I was posted to Hissar farm in the Punjab and after being there a few weeks I was put in control of the Hissar farm and in the second year of my service I officiated for one year as Superintendent of that farm. After that, I was transferred to the United Provinces where cattle-breeding was under the control of the Civil Veterinary Department in addition to horse-breeding operations. After eight years' service in the United Provinces, I was transferred to the Central Provinces where cattle-breeding is carried out by a special branch of the Agricultural Department.

30915. Where were you trained?—In England, at the Veterinary College, London.

30916. Would you also give us, quite shortly, an account of your staff here? You are Veterinary Adviser to Government and head of the Service in this Province. Have you any deputies?—I am the Veterinary Adviser and also Superintendent of the Department. I have a second Superintendent who is an Imperial Service Officer and has six years' service in India and former war service and service in various colonies. In addition to that I have six Deputy Superintendents. I am allowed 22 Inspectors, but I have only 16 now. My cadre of Veterinary Assistant Surgeons is 145; at the present time only 129 are actually working.

30917. These are the officers who work in the dispensaries under the District Boards, are they?—Yes, in the dispensaries and also on peripatetic duties.

30918. What do you think about the calibre of these men?—We are in a way unfortunately situated in this Province, because we are dependent entirely upon recruits from outside the Province itself. We have no Veterinary College for training these men, and the result is we have not got the best type of men in the Province.

30919. Could you carry a Veterinary College in this Province at this stage of development?—Yes.

30920. So that the teaching you are giving in connection with the Agricultural College is the veterinary teaching which students require for their agricultural degree?—Exactly.

30921. Have you premises or laboratories at your disposal?—Only a few rooms in the Agricultural Research Institute.

30922. Do they meet your requirements?—No.

30923. Are they too small?—Yes. There is no accommodation for experimental work. It is impossible to have any wards for animals inside the Research Institute.

30924. Have you any compound where cases can stand?—Not attached to the Research Laboratory.

30925. You have got a dispensary in Nagpur, I take it?—Yes.

30926. Do you suggest that there should be animal wards attached to the research section in addition to the compound attached to the local dispensary?—Yes.

30927. You do not suggest merging the local dispensary with the Research Institute?—No.

30928. That could not be done?—That could not be done. We are not allowed to take and retain in the dispensaries animals suffering from contagious diseases.

30929. You have seen in the matter of animal husbandry and the improvement of breeds both the system where an officer of the Veterinary Service is charged with the duty of administering the work and the system where the Agricultural Department undertakes the responsiblity. Which do you prefer?—Judging by results, I should prefer the Civil Veterinary Department to the Agricultural Department.

30930. You prefer the Veterinary Department to be in charge of animal husbandry generally? Is that your idea?—Yes, on principle.

30931. What about practice, which after all is the important thing?—I do not think it would be practicable in a Province like this.

30932. Then you would leave things as they are in a Province like this?—Yes.

30933. Do you distinguish between the conditions in this Province and conditions in the Punjab?—Yes.

30934. Would you tell us how they differ?—In the Punjab an entirely different animal is required. The fields are small in this Province and smaller types of animals are required than in the Punjab.

30935. I understand the problems are quite different, but I do not see why the difference should apply in this matter of a decision as to whether the Agricultural Department or the Veterinary Department should take charge of animal husbandry?—I think in a sense it is entirely due to luck. I think they have had particularly good men in the Punjab, who were able to take this work up. It is not a job that everybody can take up. There are veterinary men who seem to be specially useful at this kind of work.

30936. What you mean is that you would not like to disturb the existing arrangements in this Province?—Not in this Province.

30937. I understand that you attach great importance to the public health aspect of the veterinary work. Do you think it is likely to be a field of growing importance?—Yes, I think so.

30938. Do you think that future research is likely to show a considerable number of diseases shared in common between man and animals?—Not so much that as that the present diseases which are recognised need a tremendous amount of work.

30939. You mean diseases like tuberculosis, parasitic diseases, intestinal paresites and the like?—Yes.

30940. On the whole you appear to be satisfied with the services rendered by the Muktesar Institute?—Yes. I am quite satisfied.

30941. You do not complain seriously of the delay in obtaining the serum?—No.

30942. Considering the magnitude of their task, do you think they discharged it satisfactorily?—Excellently.

30943. You would not suggest making serum in provincial institutes at this stage?—Not at this stage, so far as this Province is concerned.

30944. It is very expensive to prepare?—Yes.

30945. Is there much demand for preventive inoculation against rinderpest in this Province?—Yes, a tremendous demand.

30946. That is all for the simple and not for the simultaneous method?—Yes. The serum-alone method is the one used in this Province.

30947. That, of course, gives a very short period of immunity?—Yes.

30948. Is it the question of expense that prevents you from recommending the simultaneous method for general purposes, or difficulties of administering it?—Indirectly it means a tremendous increase of staff to carry out the simultaneous method.

30949. Have you attempted the simultaneous method here?—Not at all.

30950. You think that it is a sound policy?—Yes.

30951. You are considering the advisability of such a step?—Yes. In fact the matter is before the Local Government.

30952. You have to ask the Local Government whether they are prepared to change the present method to the simultaneous method?—I should always do so.

30953. Have you any ideas on the improvement of the cattle breeds in the Province which you would care to lay before the Commission? Is it a problem to which you have applied your mind?—Being a subject taken up entirely by the Agricultural Department, I would prefer not to make any statement regarding it.

30954. You would probably agree that the condition of many of the cattle that one sees on the roads here is deplorable?—That must be so, there is no means of getting rid of it.

30955. I understand that there is close and intimate touch between your own department and the Department of Agriculture?—Yes, we have always worked very well together.

30956. How are these officers who are working in the dispensaries under District Boards carrying out their duties? Are you satisfied with the manner in which they are working?—I am satisfied.

30957. Are you responsible for inspection?—Yes.

30958. What is the pay of your inspecting staff?—A Veterinary Assistant Surgeon starts on Rs. 60 a month, rises to Rs. 90 a month, and after that there is the selection grade.

30959. Have you had many complaints against Veterinary Assistants from cultivators directly or indirectly?—Very seldom.

30960. *Sir James MacKenna*: In reply to the Chairman, you gave a statement of the provincial sanctioned strength. Would you say that that was a fairly generous establishment for the size of the Province as compared with other Provinces which you have been in?—No, I think it is very small.

30961. It does not come up what you consider your provincial requirements ?—No, not at all.

30962. And you work both systems ; you have got itinerant Assistant Surgeons and fixed Assistant Surgeons in charge of dispensaries. What is the proportion of officers employed on each of these sides ?—Roughly, 33 per cent are itinerant men and 66 per cent are stationary.

30963. Do you approve of that proportion ?—I do not entirely approve of it, but it is a matter of expediency ; one must have a man in the dispensary, whereas it is not absolutely essential that you should have a touring man.

30964. Have you formed any idea in your own mind what establishment would be suitable for this Province ? Have you thought out a scheme ?—I have sent a scheme up to Government for the provincialisation of the department.

30965. What about Imperial officers in the way of Deputy Superintendents ? You would not increase them much, I suppose?—I should have to ask for a large increase of Imperial officers, certainly one for each Division.

30966. That would be 5 ?—Yes, of course, if simultaneous inoculation has to be carried out, there would have to be officers on special duty, and also in connection with the possible Research Institute.

30967. What is your idea about the ultimate expansion of the Veterinary Assistant's sphere of activities ? What area would you take as the minimum average area which he should work ?—I think there should be room for at least two in each tahsil.

30968. One stationary and the other itinerant ?—Yes.

30969. Have you seen the report of the Burma Agricultural Committee, which sat 18 months ago, in which a considerable expansion of the Veterinary Services was put forward ?— I am afraid I have not.

30970. You might write for a copy ?—Yes.

30971. Is the incidence of cattle disease pretty heavy in this Province ?—It is in some years.

30972. Is it rinderpest ?—Yes.

30973. Have there been many outstanding epidemics in recent years ?—There was a fairly bad epidemic last year.

30974. Were the figures of mortality very high ?—The mortality is comparatively small even from rinderpest. I should put it at about 50 per cent mortality. The cattle of this Province seem to have a tremendous natural immunity.

30975. You have a good deal of trouble from your borders ?—That is one of our chief difficulties.

30976. So that a large amount of your itinerating Veterinary Assistants' work is veterinary policing?—I do not believe they do very much in that way.

30977. You are rather badly situated, right in the midst of Indian States ?—Yes. One could clear a district practically of rinderpest, but a few weeks after you get herds of animals coming through from some other places and spreading it all round.

30978. Do you think there is much rinderpest amongst your jungly animals ?—I think it is quite possible.

30979. It is a potential source of infection ?—Yes.

30980. You suggest the setting up of a Provincial Veterinary Research Institute ?—Yes.

30981 Do you think of linking it up with the Public Health Institute ?—It is to be built ; the scheme has been put through, but unfortunately something has held it up.

30982. Would you place the building of the Veterinary Research Institute along side the Public Health Institute ?—Yes.

30983. You think it is better linked up with the Public Health Institute than with the Agricultural College ?—Yes.

30984. Because you are working on similar sorts of subjects?—Yes.

30985. *Prof. Gangulee*: Besides rinderpest, what are the chief cattle diseases in the Province?—Anthrax, haemorrhagic septicemia, blackquarter, and the various forms of piroplasmosis.

30986. You have no foot-and-mouth disease?—Yes, we have.

30987. Is it in a very bad form?—No; it is usually of a very mild type.

30988. What about non-contagious diseases?—They are treated in the ordinary way at veterinary dispensaries and also by the men who go out on tour.

30989. Are you satisfied with your reporting agency? Can you tell us how an outbreak is reported?—I am not at all satisfied with it. The report is usually furnished by the *patwari*, who is a very hard worked official, and he probably has control of several villages; by the time his report reaches us, considerable delay has usually occurred. A system has been introduced of providing post cards for the reporting, and it certainly seems to be a very good system, it has improved reporting tremendously.

30990. What time does it take for a case to be reported?—I should think the average time is 10 days.

30991. That difficulty can perhaps be remedied by having more reporting officers in the country?—I think so.

30992. You have a laboratory staff here; what are their qualifications?—The laboratory staff attached at Nagpur is one Deputy Superintendent; he has the ordinary qualifications of the veterinary college graduate in India. He is a graduate of a veterinary college in India, and in addition to that he has taken a few months' course at the Muktesar laboratory.

30993. They do the routine work and the diagnosis of disease?—They can diagnose diseases from films submitted to them.

30994. If you had had a well-equipped veterinary laboratory, what particular item of research would you have undertaken?—Piroplasmosis is the most important at the present time.

30995. You have given three interesting tables in your report, and you preface your remarks by saying that ignorance, apathy and, where the cow is concerned, religious prejudice have been the main stumbling blocks to the diffusion of veterinary knowledge, and yet, I find there is a great deal of improvement. For instance, with regard to your inoculation work, from 1901 to 1905 you had only 1,428 cases; for the period 1920-25 the number is 19,757. That shows that a good deal can be achieved by propaganda?—Undoubtedly.

30996. Then, would you lay the whole blame at the door of the people's ignorance, apathy and so on?—I think it is the main cause.

30997. Judging from the figures that you have given us, the number of your inoculation cases, the cases treated in dispensaries, and also the number of castrations, it seems to me that it only indicates that a great deal could be achieved in spite of ignorance, apathy and religious prejudice to make the Veterinary Service popular?—I think that refers particularly to inoculation, not to treatment.

30998. The number of treated cases has also increased. From 29,000 cases in 1900-1904 it has increased to 429,000 in 1920-25; that is a decided improvement?—Yes.

30999. You state here that you have a scheme for providing a Research Institute in Nagpur; could you supply the Commission with the details of the scheme which you presented to Government?—Certainly, I will.

31000. Is there any private veterinary practitioner here?—No.

31001. Do you notice any periodicity in the outbreaks of rinderpest?—Yes.

31002. Do you find that the monsoon or other conditions have any special effect?—It does not come at any particular time of the year; it seems to come in waves every five years; I do not think the climate or the weather has anything to do with it.

31003. How do you treat foot-and-mouth disease cases in your laboratory?—They are treated only in dispensaries and not in the laboratory. One of the chief duties of the Assistant Surgeons is the treatment of these cases.

31004. How are they treated? According to Col. Walker's method?—If you mean the subcutaneous injection of iodine, we have tried it, but it is not a good method. The ordinary method is to wash out the mouth with some material and disinfect the feet.

31005. Is there really a demand for veterinary education here?—Yes. At the present time, I have had roughly 60 applications for six or seven scholarships which are given to students of the Bombay College.

31006. Do you give lectures to the students in the Agricultural College?—I do not.

31007. Who does that?—The Veterinary Inspector, who is lent to the Agricultural Department and also the Veterinary Assistant who is in charge of the dispensary.

31008. What are their qualifications?—They have the qualification of graduate of an Indian veterinary college.

31009. *Mr. Calvert*: I think you informed the Chairman that the success of the Hissar Cattle Farm was largely due to there being good men in charge?—Yes.

31010. Do you think the opportunity afforded in the Punjab has attracted good men there or do you think it is merely luck that we have had good men there?—I do not think it can be due to the opportunities because I know of very few men who have been transferred to the Punjab at their own request from any other Province. I think most of the men there have been posted right away to the Punjab on appointment; I think possibly a good deal is due to the fact that their work is appreciated more in the Punjab than in other Provinces.

31011. That stimulates then to greater activity?—A great opportunity like Hissar makes men more keen.

31012. Is there in the Civil Veterinary Department any lack of good men to take over cattle-breeding?—No, I do not think so; I think there are plenty of them who would be willing to do it.

31013. *Sir Henry Lawrence*: Are there many *pinjrapoles* in the Central Provinces?—I do not know them by that name. Do you mean places where old and decrepit animals are kept?

31014. Yes. What do you call them?—They are called *gowrakshans*. There is one in Nagpur.

31015. Do they ask for the advice of officers of your department?—No.

31016. You have no relations with them at all?—None whatever.

31017. Do you think it would be possible to do anything to improve the lot of cattle by getting into touch with them?—I do not think so, because I do not think that class of cattle could be improved; they are very old decrepit cattle.

31018. Have you ever visited any *pinjrapoles*?—No.
There is a big field of work opening for that in Bombay.

Sir S. M. Chitnavis: There is only one in this Province; it is at Nagpur.

31019. *Sir Henry Lawrence*: Do you get your recruits from the Veterinary College in Bombay?—Yes.

31020. Entirely?—No. We get men for this Province from Bombay; they are sent there with Government stipends and scholarships.

31021. From where else do you recruit?—From Madras, the Punjab and Bengal.

31022. Can you say whether you find one class of recruit better than another?—I can certainly say that the men of the Punjab are not so good for work in this Province as the men from Madras.

31023. Do you find that the Madras Institution turns out the best men?—For this Province, undoubtedly.

31024. How do they compare with the men turned out from Bombay?—They are much better; the knowledge of English of the Madras men is so much better and their education is so much superior.

31025. Then why do you not send your stipendiaries to Madras rather than to Bombay?—Because the Madras course is not considered quite so suitable for them; their knowledge of English would not perhaps be good enough for them to take the Madras course; besides, at Madras they insist on the Matriculation as the entrance qualification.

31026. If you insisted on that standard you would not be able to get recruits?—I can now, but during the last few years I should not have been able to get them.

31027. I see from your note that you are making very good progress in sterilising unfit bulls?—Yes.

31028. Do you think that will have an appreicable effect on the improvement of stock in time?—I think it must.

31029. Do you experience difficulty owing to religious scruples in the matter?—Not with regard to castration; the only difficulty we have to deal with is that certain castes, such as the *Mahars*, have been so accustomed to carry out that work that possibly they might give a little trouble and try to prevent our men doing it.

31030. Because of the loss of their employment?—Yes, I do not quite know what the system is, but I suppose they were given hides in return for what they did.

31031. *Sir Thomas Middleton*: I think you expressed the view that on the whole the veterinary man had been more successful in the management of cattle breeding enterprises in India than the agriculturist; is that your opinion—Only in one particular Province, the Punjab; I was not speaking generally.

31032. You would agree, I think, that the actual training of the veterinary student does not give him much instruction in the management of healthy animals?—Not the average student trained in India.

31033. Or the average student trained in England?—He certainly has to study a good deal of hygiene and animal breeding and matters connected with it.

31034. One does not see many cattle at the Royal Veterinary College, for example?—No, being in London, I do not think, one could reasonably expect it.

31035. Do you find them in any other veterinary college?—I do not think they would be found in any veterinary college.

31036. The point is that if a veterinary officer is training for this type of work he must be apprenticed somewhere after his veterinary training, either on a farm in this country or on a farm in some other country where cattle-breeding is a business?—In the ordinary way a student at Home goes out to see practice during the vacation time, and on those occasions he comes very closely into touch with the work at breeding farms.

31037. It may be a good district or a bad one?—Yes, that may be so; it depends entirely on whether he goes in for country or town practice.

31038. Would you not agree that if there was any idea of utilising veterinary graduates for such posts, they ought to have a period of apprenticeship under a capable manager in this country?—I think that would be absolutely necessary.

31039. Does the absence of a veterinary college place you at any disadvantage in your own department in recruiting the men you want? You have a choice of recruiting from all the colleges in India?—Yes.

31040. If you find Madras men the best for your purpose you can go to Madras, or you can go to Bombay if you prefer Bombay men?—But we cannot depend on the supply being sufficient.

31041. Does it mean that these local colleges, Madras and Bombay, select the best men for their own Province and let you have the balance?—Undoubtedly.

31042. Is that what happens?—Yes.

31043. You might get over that by sending them a larger number of scholars; you send at present seven scholars?—Yes.

31044. Could you not overcome your difficulty by sending a larger number of scholars from the Province?—Well, it could be done, but it is a matter of increased expenditure.

31045. It would be very much less expensive than setting up a veterinary college to train the comparatively small number of men you require?—Yes, but there are other circumstances which prove that we ought not to have to depend on outside Provinces, because as a rule men in a particular Province are not very fond of going out of that Province for training.

31046. Do you not think it does them a lot of good to go out of the Province for training?—I think it would, but they do not seem to like it.

31047. What does it actually cost to immunise animals against rinderpest in such a district as Chhattisgarh, for example?—The cost of the serum is 6 annas per dose; it would not cost very much more; it would only mean the extra expenditure on the cost of virulent blood.

31048. It would involve, of course, the maintenance of additional local staff?—Yes.

31049. And that would add very much to the cost?—Undoubtedly.

31050. Can you give me any sort of indication of the cost per head for simultaneous inoculation, assuming a certain number of animals require inoculation?—At a Government agricultural farm, or out in the district?

31051. Under any conditions which you may select?—I am afraid I cannot supply that information, because we have not yet carried out simultaneous inoculation, and I have not really worked out the cost.

31052. I am asking myself what percentage of the cattle in certain districts would be worth the cost of serum for simultaneous inoculation?—I think about 2 per cent. That is the sort of impression I had formed.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Tuesday, the 25th January, 1927.

Tuesday, January 25th, 1927.

NAGPUR.

PRESENT :

The MARQUESS of LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E , I.C.S.
Raja SRI KRISHNA CHANDRA GAJA PATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.

Mr. C. U. WILLS, I.C.S.
Sir SHANKAR MADHO CHITNAVIS, KT., I.S.O. } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Mr. C. J. IRWIN, C.I.E., I.C.S., Commissioner, Jubbulpore Dn.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—I have no suggestions to advance regarding agricultural research. With regard to the Veterinary Department, I need only refer to the last three reports on the Civil Veterinary Department of this Province where the necessity for a proper local veterinary research institute has been strongly urged. I do not think the Veterinary Department of this Province can do the best work possible without an institute for research, and proper accommodation for the keeping of control animals and the like.

QUESTION 2.—AGRICULTURAL EDUCATION.—I have no experience of special agricultural education. The only portion of this question on which I have any remark to make is as regards questions (viii) and (xii).

(viii) In the present state of development of local schools in this Province, I do not believe that ordinary school instruction in agriculture by means of school plots or school farms or nature study has been or will be of any value. The teacher is almost always a half-educated Brahmin with no interest whatever and no knowledge of agriculture. Ordinarily, the only source from which the village school boy in this Province is likely to learn anything about agriculture is from his parents and friends in his own village. But visits to demonstration plots managed by the Department of Agriculture, such as are now being arranged, may be of some use.

(xii) I do not quite understand what form of adult education is intended by this question. I believe the Agricultural Department are contemplating a wide use of the cinema. This will probably have effect as the majority of adults in rural tracts take no interest in obtaining education, and will be difficult, if not impossible, to educate except by example and through the eye.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The only measures in question are field demonstrations.

(*b*) Field demonstrations can be made of wider effect if the officials in the Agricultural Department tour and preach to a sufficient extent in the villages

adjoining the site of the demonstrations. In this connection, it is very necessary to insist on complete co-operation between the officials of the Agriculture and Revenue Departments. Hitherto this co-operation has been insufficient although conditions are improving. The necessity for such co-operation cannot be too strongly insisted upon.

(*c*) I have already referred to the use of the cinema by the department as well as constant touring and co-operation with the Revenue Department. The whole point is to make the cultivator come and see the results of improved methods, but no amount of such demonstrations will be of any effect if it is not made clear that the methods recommended are (i) within the means of the ordinary cultivator, and (ii) are conducted on lands similar to the average land of the locality.

QUESTION 4.—ADMINISTRATION.—(*b*) Ordinarily, I should deprecate centralisation, but it is possible that with agriculture as a transferred department, subject to the whims of a possibly unstable public opinion, it might be desirable to make research as far as possible a central subject, leaving to the provincial departments the teaching of improved methods, the distribution of improved seed and propaganda.

(*c*) (i) So far as I have experience of them, the Agriculture and Veterinary Services, as at present constituted, are doing as much as they can, with the resources at their disposal.

(iii) *Roads and bridges.*—The improvement of agriculture in my view is very closely connected with the question of communications. In the Jubbulpore district, to take one instance only, the great part of the best land of the district is completely land-locked, and it is difficult to get the produce to any kind of market. If we give the cultivator good communications he can get more for his produce, and the more money he has, the more likely he is to adopt improved methods which would ordinarily be beyond his means.

(iv) Reliable reports about the monsoon would undoubtedly be extremely useful, especially in the cotton country, but at present I doubt if the forecasts obtainable from the Meteorological Department would be sufficiently reliable to make it worth while broadcasting them.

QUESTION 5.—FINANCE.—(*a*) The question of the financing of agricultural operations is developing of itself. Thus the Imperial Bank now advances money against produce lodged in the Bank's godowns so far to enable the producer to hold his crop against the best market. This is probably sufficient for the bigger cultivator; for the smaller men I can suggest no method but the steady development of the co-operative credit system. Any question of the alteration of tenure so as to enable holdings to be given security is presumably outside the terms of this reference.

(*b*) I do not think it is desirable to endeavour to extend the use of *taccavi*. The system is inelastic, and if money is thrust upon the cultivator on too easy terms, there is a risk not only of pauperising the borrower, but of losing a considerable amount of Government money.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) A cultivator may borrow money for a variety of purposes: for bullocks, for seed, for manure or for social celebrations in his family. For none of these purposes is he likely as a rule to put away money. The principal cause of borrowing, therefore, may be said to be an absence of a spirit of thrift. At the same time, it must be remembered that a great number of the smaller cultivators in the country are never very far from the margin of subsistence and any unusual expenditure is probably beyond their powers of saving.

(ii) For the ordinary cultivator, the source of credit is usually the small village moneylender or the landlord. These men operate largely on capital accumulated by themselves, but occasionally on funds borrowed from the larger moneylenders in the bigger centres.

(iii) The chief reasons preventing repayment are (*a*) general carelessness and lack of forethought, and (*b*) the same reason that accounts for a certain amount of borrowing, *viz.*, the fact that the small cultivator is living on the margin of subsistence.

I have also come across the curious reason which accounts also for failure to take up *taccavi*, *viz.*, the desire to remain on the books of the moneylender so that he will be ready to deal with the borrower on subsequent occasions.

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(*b*) I can suggest no special measures for lightening the burden of debt. It might and probably would be desirable in most places to urge the Civil Judges to apply more freely the Usurious Loans Act; but the only way to get rid of rural debt is to make the people earn more and be more thrifty. Towards the latter result co-operative propaganda should help. At the same time, it must be remembered that in endeavouring to raise the financial condition of the ordinary rural population one's labours are always liable to be upset by the tendency of the rural population to multiply up to the margin of subsistence.

(*c*) I do not believe in measures to restrict the right of transfer except in very backward tracts. In more developed tracts, the only result of the present protected tenure in this Province is to cut down the amount of capital which the cultivator can obtain for the development of his holding. If a cultivator desires to transfer his holding, he will do so, and if transfer is restricted by the right of pre-emption given to a third person, the only result is that the cultivator will lose part of the value received on transfer, in order to shut the mouth of the third party.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—I have no real experience of excessive fragmentation. In general, I can suggest no special means for consolidation except co-operation. The chief obstacles in the way of consolidation are presumably general apathy and distrust and jealousy of each other among the cultivators. As regards question (*c*), on the face of it I should regard legislation to the effect that no contingent interests should be allowed to interfere with consolidation to be desirable.

QUESTION 9.—SOILS.—(*c*) This question is difficult to answer without concrete instances, as circumstances will vary according to the reason why the cultivable land has gone out of cultivation. In this Division, I understand there is a considerable quantity of land ruined by *kans* grass, and the Department of Agriculture are taking steps to eradicate this pest by mechanical ploughing.

QUESTION 10.—FERTILISERS.—(*f*) The only method possible is to prove to the cultivator that it pays him better to procure and use firewood than to use cowdung as fuel. It is difficult to prove this by any form of actual demonstration which would appeal to the cultivator, and until this can be done the efforts which have been made for many years to discourage the practice of using cowdung as fuel are unlikely to succeed.

QUESTION 11.—CROPS.—(*a*) (iii) At present, in this Province I understand the Department of Agriculture is succeeding in distributing a considerable amount of good seed by means of seed farms or arrangements by which certain large cultivators undertake to grow pure seed. An extension of these methods to procure pure seed is extremely desirable since the provision of pure seed enables the cultivator to make more money and thereby to improve his methods.

(iv) For the prevention of damage by wild animals, there is only one remedy, *viz.*, the extinction of the wild animals. Against this it is usual to urge a considerable number of more or less sentimental objections, but these are mostly based on out-of-date feudal ideas regarding the preservation of game. The provision of elaborate fencing is obviously an uneconomic palliative only. The problem of exterminating wild animals, particularly pig, is one which has not yet been tackled with any great success in any area of which I have any personal knowledge, but it should be possible with proper organisation, and with the assistance of the Forest Department to make the wild boar as extinct in India as it is in England.

QUESTION 14.—IMPLEMENTS.—(*b*) The condition precedent to the adoption of improved implements, as of any other improvement, is to enable the cultivator somehow to earn more money, so that he can put more money into his cultivation. Given this, continuous demonstration will end by convincing the cultivator of the value of improved implements; but if he is to take them up it must also be shown that they are reasonable in price and that they can be easily repaired in or near his village.

QUESTION 15.—VETERINARY.—(*a*) The Veterinary Department should certainly be independent, if the Director of Agriculture is to be a technical officer of that department. The only circumstance in which the Veterinary Department and the Department of Agriculture could usefully be combined under one head

is where the Director is a purely administrative officer. If this condition is not present it is far better to have the two departments separate under the control, purely in administrative matters, of the Secretariat.

(*b*) (i) My experience is that District Councils, under whom the veterinary dispensaries have been placed in this Province, are generally completely apathetic in their regard.

(ii) I do not think that these local bodies appreciate the value of the operations of the department. One frequently finds that the Veterinary Assistant, who is provided by the Provincial Government, is housed in a room in the local *serai*, where he cannot do his work properly. I have always held that the profit made on the operation of cattlepounds should be spent on veterinary dispensaries; but it is difficult to make the local bodies see that this money, which comes from the cattle of the district, should be spent upon them.

(iii) The control of dispensaries by the provincial authority would undoubtedly lead to greater efficiency. The only argument for leaving them under the District Councils would seem to be the educative effect of the managemnt of these institutions by the local representatives of the people. So far, however, I have seen no evidence that such an effect has been achieved.

(*c*) (i) and (ii) Full use is not made of dispensaries. There are no touring dispensaries in this Province, but Veterinary Assistants go on tour and treat animals while on tour, and as time goes on this touring and regular attendance at the villages where there are outbreaks of epidemic disease, should help to demonstrate the value of the work of the department.

(*d*) The present law probably goes as far as it is possible to go in regard to regulations dealing with contagious diseases of animals. The only measure I should like to advocate with regard to this Province in particular is some method of examination of herds from Indian States coming into this Province so as to exclude carriers of disease. Practical difficulties have hitherto prevented any measures of this sort.

(*g*) See my answer to Question 1.

QUESTION 16.—ANIMAL HUSBANDRY.—(*b*) (i) The overstocking of common pastures is one of the principal obstacles in the way of the improvement of cattle in this Province and particularly in parts of this Division. In the poorer villages, even the bullocks are left to pick up such a living as they can almost entirely from the village waste. More valuable bullocks and the plough cattle generally in the better cultivated areas are either stall-fed or given a considerable amount of extra food. As a rule, cows are not stall-fed at all. Old and useless cattle, owing to the sanctity of the cow, are left to die of old age, while still consuming a considerable quantity of the common food and thereby restricting the amount available for better class of cattle. The results to the agricultural stock generally can easily be imagined, specially to the breeding stock on which the production of the plough cattle of the future depends. As long as the prejudice against the elimination of unfit cattle exists, I can see no way of getting over this difficulty.

(ii) I know of no regular closed pastures in this Province, and the grass borders in tilled fields are generally negligible as a source of cattle fodder.

(*d*) There is almost an unlimited supply of hay to be obtained from the Government forests, provided the people concerned will take the trouble to cut it in time, and in the majority of tracts in this Division the cultivator if he chose to take the trouble could obtain a considerable supplementary supply of fodder for his cattle. I regard the utilisation of the existing supplies of hay, to be cut at the proper season when the sap is in it, as more important and desirable than the growing of fodder crops on land that might be used for food or commercial cropping.

(*e*) Landowners and cultivators will only take interest in these matters if it is shown in some way that there is a profit to be made.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*c*) As a rule, in this Province such industries as bee-keeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc., would be precluded by caste objections.

(*d*) I do not greatly believe in the artificial establishment of such industries as are mentioned by Government. If it were possible to demonstrate the prospective profit from such efforts, and then get the people to take the matter

up for themselves, such industries would succeed. But, started by Government, they would almost certainly die as soon as Government influence is removed.

(*e*) I do not quite follow what is meant by this question. If it is intended that a man should work in a factory the greater part of the day, and employ his spare time on agriculture, the suggestion seems to be objectionable.

(*f*) I know of no rural industry in this Province which would repay intensive study.

(*h*) If the general wealth of the people can be increased, they will themselves take more interest in improving their environment; for the rest propaganda, assisted as I have suggested by the cinema, might achieve a certain measure of success.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) I am not aware of any area in which there is a surplus of agricultural labour. Where there is a shortage at harvest or similar busy times, the shortage is usually made up by seasonal migration. In large area of uncultivated land in this Province, it would be better dealt with by settlement with cultivators than by the importation of labour to work under the local capitalist. The obstacle in such cases as I have seen is the system of land tenure which is outside the terms of this reference.

QUESTION 19.—FORESTS.—(*a*) We are working up by degrees in this Province to the fullest utilisation of the forest lands. There is a certain amount of dispute at present as to the amount of grazing facilities which can be allowed compatibly with the preservation of a sufficient reserve of timber. The question is being dealt with by the new establishment for the drawing up of and revision of Working Plans. As long as the system is followed by which a revenue officer is invariably associated with the Working Plans Officer in order to deal with local requirements, I do not think the procedure can be improved upon.

(*b*) As a rule, the local cultivators can obtain firewood and fodder in sufficient quantities if they take the trouble. At present, I doubt whether any attempt to create a demand for extra firewood or fodder in areas at a distance from the forests would be successful. An attempt was made, I believe, a year or so ago to popularise baled hay in Berar, where there was a considerable shortage of fodder and I believe the experiment was unsuccessful.

(*e*) Any form of afforestation in the ordinary Central Provinces village area would be far too expensive to be thought of.

(*f*) I do not think that the forests are suffering from excessive grazing. The enthusiastic Forest Officer is apt to urge that his forests are overgrazed but over a great portion of the Province there is little danger of this.

QUESTION 20.—MARKETING.—I understand special statistics have been collected with a view to answering this question and I therefore offer no remarks.

QUESTION 22.—CO-OPERATION.—(*a*) The only remark I have to offer regarding this question is that I am convinced that in this Province we went too fast at the start, and the development of the future should not sacrifice quality to quantity.

(*c*) I agree that there should be some power of coercion in the case of such measures as co-operative consolidation of holdings. With regard to irrigation, under the long-term agreement system in force in this Province at present, where the occupants of the four-fifths of the irrigable land agree to come under the agreement system, the remainder are compelled to do so; and similar provision might be made in all such cases.

(*d*) I have no personal knowledge of any society.

QUESTION 24.—ATTRACTING CAPITAL.—The only way to attract capital to agriculture is to show that it pays. In certain cases, I believe, the Department of Agriculture has shown that with capital certain forms of agriculture can be made to pay handsomely. Similarly, unless the owner of land can be shown that an improvement will bring him in a definite profit, it is not likely that he will be persuaded to undertake it.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) The first necessity is to give the cultivator more money, by enabling him to sell his produce better, and to improve its quality by the distribution of pure seed or otherwise. But even then it is improbable that the ordinary cultivator will raise his standard of living, and the increase in wealth is likely to be absorbed by an increase in the population.

(*b*) and (*c*) I have read several economic surveys of typical villages, and the only result of every one of them appears to be to prove conclusively that the cultivating class is about to be ruined, and that there is no profit in agriculture. I have, in common with other Settlement Officers, come up against the same difficulty during the operations of settlement, where there was always an attraction in the search for the ideal average cultivator. The result of most enquiries made is the same, namely, to demonstrate that there can be no profit in cultivation of land; yet if this were so land could not change hands at the comparatively high prices at which it is transferred over a great portion of the Province.

QUESTION 20.—STATISTICS.—So far as I am aware, the present methods in vogue in the Central Provinces for the collection of agricultural statistics are sufficiently accurate for all practical purposes.

Oral Evidence.

31053. *The Chairman:* Mr. Irwin, you are Commissioner of the Jubbulpore Division in the Central Provinces?—Yes.

31054. You have provided the Commission with a note of the evidence which you wish to put before us. Would you like to make any statement at this stage?—No; I have no particular statement to make.

31055. Would you tell the Commission what you take to be the responsibilities of an officer holding your present post?—With regard to agriculture?

31056. Yes, and economic development generally?—With regard to agriculture his duties are largely confined to inspection and he can also help the officers in the technical department by making suggestions with regard to any difficulties they may have with the people. I am not quite sure what is meant by his responsibility with regard to economic development; it is rather a large field.

31057. Take the question of responsibility a stage lower; what are the duties and responsibilities of a Deputy Commissioner in that direction?—They are very much the same. The Deputy Commissioner touring in his district will take notes of the requirements of the people and will bring them to the notice, if necessary, of the technical departments concerned.

31058. But broadly speaking, it is his duty to take an interest in the economic development generally?—In touring his district he would see these things.

31059. What is the area of your responsibility, your Division?—I cannot tell you the actual number of square miles off-hand; it consists of 5 districts.

31060. Is it all malguzari settlement?—There is a certain amount of ryotwari as well, but not a very great deal. The general system is malguzari, with ryotwari settlement in the areas taken recently from forest.

31061. Under the malguzari system, what is the smallest area in which you have a direct representative? You have your Deputy Commissioners?—Yes; under the Deputy Commissioner there is the Tahsildar and under the Tahsildar there is the Revenue Inspector; I should think the Revenue Inspector would probably be the lowest representative of the Government, but the *patwari* who is the village accountant and who keeps the land records of the village is actually the lowest. He is now practically a Government servant and he is paid direct by the Government.

31062. These things differ between Province and Province and it is interesting to discover any discrepancies. Now turning to your note, I judge from your answer to our Question 2, Agricultural Education, that you regard the imparting of literacy as the first objective of the primary system of education?—Yes, to a certain extent. I consider what the ordinary agriculturist in this country requires is sufficient literacy to be able to follow simple accounts, to be able to check his accounts with the moneylender and so on.

31063. And probably to read the leaflets distributed by the Agricultural Department?—I would not go so far as that. I doubt really if those leaflets reach the actual cultivator very much, perhaps the landlord but hardly the tenant.

31064. In answer to Question 2 (xii), you say you do not quite understand what form of adult education is intended. What was intended was this: adult education in its widest sense; that is to say, the imparting of literacy to adults. Have you experience of any experiment of that sort?—No, I have none.

31065. In answer to our Question 3, Demonstration and Propaganda, would you tell the Commission what your opinion is as to the calibre of the men who are engaged in demonstration? Do you think they are of the right stamp?—I have not very great experience, to tell you the truth. I have not seen a great deal of the actual work of the Agricultural Assistants in the field. I have a certain knowledge from hearsay, but I have no personal experience on which I would like to base an opinion.

31066. Then you suggest that there might be co-operation between the Agricultural and the Revenue Departments. You express the view that hitherto the co-operation has been insufficient although conditions are improving. Would you develop that a little?—What I meant was this: I have had complaints from some Deputy Commissioners that they did not know what was going on, what the technical departments were doing. I think the fault in regard to that is on both sides, to some extent. On the other hand, there are Deputy Commissioners who insist on taking local Agricultural Assistants on tour with them; it is obviously the proper thing to do. It is a question of development, I think; I doubt if one can lay it down in rules.

31067. Do you think that demonstration and propaganda have had a fair share of the attention and funds of the Department of Agriculture as compared with research proper?—I do not know how the expenditure compares; I have not looked the figures up; but I know the department is endeavouring to get a very much larger number of demonstration plots and that Government, a year or so ago, sanctioned a certain amount of money to provide new demonstration plots.

31068. You then point out the importance of good communications to agriculture. Have you any suggestions to make for the financing of improvements in communications?—Here in this Province I gather for many years to come we shall not be able to finance communications from revenue, at least to finance the proper extension of communications from revenue. Hitherto we have endeavoured to build our roads from revenue and I think probably the line we should take in the future is to build a certain number of new roads from loans, as we do on a small scale in the case of forests at present; forest roads are largely built from the Forest Loan Fund at present.

31069. In other words, you would borrow for the capital charge and put the maintenance on the revenues?—Yes; there is a slight difficulty about that in this Province, that is, whether we could afford a very extended programme of road development if it was going to mean a very large recurring charge for maintenance, because our revenues are not very large.

31070. Still it has been a more progressive method than to attempt to finance both from the revenues?—Yes.

31071. You take rather a pessimistic view of the value of the forecasts obtainable from the Meteorological Department. Are you familiar with them?—We do not get them really very much here. My knowledge, I am afraid, is merely from the daily newspapers.

31072. In answer to our Question 6, Agricultural Indebtedness, I am interested to see that you had come across the curious explanation for the fidelity of borrowers to the moneylender, that they are anxious to keep on the books of the moneylender so that they will be able to borrow whenever they require a loan?—Yes.

31073. Have you ever heard it suggested that a moneylender will refuse to lend if the borrower has been borrowing from other sources?—It was given to me as a reason only this year for the tenants not wishing to take *taccavi*, that is, loans under the Agriculturists' Loans Act. For instance, if they borrowed from the Government this year and next year they went to the moneylender, he would say 'oh, yes; you did not borrow from me last year; I will put up the interest this year'. That is what they are afraid of, I understand. How far it is true I do not know, but I believe there is a good deal in it.

31074. A sort of strike of moneylenders?—Yes, to some extent.

31075. In the matter of the use of cowdung for fuel, have you noticed any change for better or for worse since you have known this country?—No; I have noticed no change.

31076. And you do not think it is any worse than it was?—No, it is not worse.

31077. In answer to Question 11, you say there is no reason why the wild boar should not be eliminated just as it has been in England. It would be somewhat a tougher job, would it not?—Yes. I understand in Bombay they had extreme difficulty; but in this Province I think it could be done.

31078. *Sir Henry Lawrence:* Why?—For one thing, you can get hold of people who are professional *shikaris*. There are a certain number of wandering tribes who could be employed; they could be organised easily.

31079. Do many of these people eat pig?—Only the very low castes. The wandering tribes and the aboriginals also eat pig.

31080. *The Chairman:* You think these feudal ideas regarding the preservation of game are apparently responsible for preserving animals that do damage to crops?—Personally I am very keen on *shikar*. But at the same time when one sees the damage that is done by the deer on the edge of a forest which is preserved one cannot help having qualms of conscience about that preservation.

31081. Are pigs preserved?—No.

31082. Do the carnivora do a great deal of damage to the cultivator?—They kill a lot of cattle.

31083. Do you think that more might be done to reduce their numbers?—I do not know that very much more could be done. I think that people are quite keen enough in killing tigers and panthers if they can. It is a difficult job and at the same time expensive.

31084. It is not a very lucrative business at Rs. 15 a head, is it?—No. But I doubt if any material raising of rewards would have much effect. The reward used to be Rs. 50 for a tiger and Rs. 25 for a panther, but I do not think that it made any difference one way or the other. In fact that was why the rewards were reduced.

31085. Would you turn to your answer to Question 15 on the Veterinary Service? You are talking there about the local dispensaries. You say "The control of dispensaries by the provincial authority would undoubtedly lead to greater efficiency. The only argument for leaving them under the District Councils would seem to be the educative effect of the management of these institutions by the local representatives of the people." You do not think that you see any evidence of such educative influence?—No; whenever I have inspected places where there are veterinary dispensaries I have endeavoured to interest the members of the local authority in them, and I have always felt that I was not doing so,—that I was not having any success in that direction. I found it very hard to make them take any interest in the work of the Veterinary Department.

31086. How long has this experiment been in vogue?—I could not tell you off-hand. But I think it has been in existence for a very long time.

31087. *Sir Henry Lawrence:* I should think from the beginning of the District Councils, that is, about forty years ago?—I do not know really.

31088. *The Chairman:* In answer to Question 17, you are talking about the caste difficulties attached to certain spare-time occupations. Do you notice any change in the outlook of the cultivators in that direction? Do you think these caste prejudices are any less than they used to be?—I cannot say that I have noticed any tendency in that direction.

31089. Under Question 19, Forests, you say that you do not think the forests are suffering from excessive grazing?—Yes, that is my impression.

31090. You do not think that the future prospects of forests would in fact be damaged by grazing areas?—That is a difficult question for the ordinary layman to answer. I think that it is a question more for the sylviculturist.

31091. *Sir Henry Lawrence:* Do you find that the District Council, when it discusses the question of spending money on roads or schools, gives preference

to schools invariably?—Yes, they are inclined to spend decidedly more money on schools. At one time I used to analyse the expenditure on schools and roads of the District Councils of this Division with a view to seeing whether the proportion which formerly existed between the road cess and the school cess was observed, and I found that they had invariably encroached on what I considered to be the proportion which should have been spent on roads.

31092. Do you think they would have been wiser if they had spent more on roads?—Yes, from the point of view of the agriculturist.

31093. We are trying to regard the whole problem from the point of view of the agriculturist at present. Do you regard roads as an important factor in the education of the agriculturist?—I think that when he is able to get about more, he will take more interest in general education.

31094. So that it may be regarded as a condition of success?—Yes. There is another point I should like to mention. I think if we had communications more highly developed, there would be less relapse into illiteracy, of which there is a very considerable proportion now.

31095. Are there any areas here so shut off through inaccessibility that the people are distinctly more backward in intelligence than they were?—Yes, I think so: for instance, large portions of Chhattisgarh where communications are bad.

31096. You are on the eve, I understand, of a more progressive policy in regard to road development?—I understand that that is so.

31097. Will that be financed from provincial revenues rather than from District Council revenues?—I have no information about that. I have heard it suggested that the financing of roads from loans should be taken up, but how far the question has got I do not know.

31098. That would be in the hands of the Minister, I presume?—I think so. The District Councils in this Province have not succeeded in collecting a very highly trained technical staff and the consequence is that any engineering work of any importance would have to be carried out by the Public Works Department. They have not got the staff to do any work of importance.

31099. But if you are going to do this by means of loan money, that loan money would be borrowed by the Province?—I take it that that would be the case.

31100. And will not devolve on the District Council?—That is what I should understand, but as I say I have not got any definite information on the subject. That is what I should certainly advocate.

31101. Then in regard to the question of caste objections, Question 17: Is your population in this Province very much handicapped by caste objections?—I was really thinking in regard to the particular subsidiary industries mentioned; for instance, lac. There are comparatively few people who deal with lac. In some places even the Gonds will not touch it.

31102. From religious prejudices?—I could not say exactly, but I know it has something to do with the social or religious prejudices of the people.

31103. What are the classes that do handle lac?—The *Mahars* have no objection to lac and there are several other castes as well.

31104. Are the *Mahars* a considerable community in this Province?—Yes, the *Mahars* together with the similar castes in the North, namely, the *Mehra* and the *Chamar*, and the lower castes generally would have no objection to that sort of thing.

31105. What do they represent in numbers? Ten or twenty lakhs?—I am afraid I should have to look that up. There are plenty of them.

31106. So that the lac industry is not in any way handicapped by the absence of people who are prepared to deal with it?—No. The ordinary cultivator with a little land would generally be a Hindu and he would object to that business.

31107. Take poultry rearing: What communities are there that refuse to touch poultry?—I think that a good many Hindus of good caste would object to deal with poultry, but I could not tell you off-hand.

31108. Have you many Mahommedans here?—Not a very large proportion. I am afraid I have not got the figures ready to tell you the exact proportion.

31109. I do not want the exact proportion. What I wanted to ascertain was whether there were a sufficient number of people who had no prejudices on each particular point?—There are certainly a sufficient number of people to make it possible to start a poultry rearing industry, not in the ordinary village but in centres. There are a considerable number of people who would take to poultry rearing.

31110. Then as regards fruit growing: Is there any caste objection to that?—That is a question more of capital than of caste prejudice.

31111. Has pisciculture at all advanced in this Province?—No: the *Dhimar* caste do it chiefly, but it has never been organised; there is no pisciculture but they do catch fish. I have never heard of anybody stocking the waters with fish spawn.

31112. Is not rope and basket making a hereditary occupation?—Rope making is practised, I think, by several castes. In a great many villages you see people making ropes as you go along.

31113. What do they use?—*Sann* hemp.

31114. Is the lack of interest in veterinary dispensaries linked up with the lack of interest in the tending of cattle generally?—Yes.

31115. Can you explain why, in the Central Provinces, so little interest is taken in the keeping and improvement of cattle?—Beyond a general lack of practical appreciation of their value to their own interests, I cannot assign any real reason. In the more advanced parts of the Province, down in Berar, the people do take a lot of care of their cattle, and they are keen on good cattle.

31116. Do they breed any cattle?—They do not breed very many good cattle, and I think they import a variety of breeds. I see enormous herds both of ordinary cattle and buffaloes coming into the Province from the States of Central India. There is a good deal of replacement in that way, but the local breed is not as a rule good. They used to have large herds of good cattle coming down from the district of Chanda to graze in the forests of Balaghat district, and some of them were good. They kept the herds fairly pure, but for one reason or another that system has nearly died out. They do not breed those cattle so much as they used to.

31117. You have a very large cattle population in the Central Provinces?—Yes, but it is largely bad.

31118. It is chiefly useless?—Yes.

31119. You do not suggest that there is any caste objection to the maintenance and improvement of good cattle?—There is no caste objection.

31120. On the question of roads and schools, can you explain what is the reason of the desire to extend schools to an extent beyond what is reasonable in the financial circumstances of the District Council?—Beyond the fact that I think the educated classes have a general idea that the more they do for education the more good they are doing to the country, I cannot say that there is anything more. I do not think they appreciate the relative importance of the two. They want to educate a certain number of people before they are fit for it.

31121. In the District Councils, is there any idea of shifting the burden of keeping the roads on to the provincial revenues?—They are always asking for grants. They are trying to get as much money as they can out of provincial revenues for roads, but I think they rather like the idea of having the management in their own hands.

31122. From the point of view of patronage?—I think it gives them a sense of dignity. I think it makes them feel that they are more important, if they are given an important job to do.

31123. Have any of the District Councils levied additional cesses for the schools?—The cesses in the Central Provinces are now amalgamated. No portion is earmarked definitely; that system has been abolished. One of the District Councils in my Division has put on a slight extra cess in order to raise more general revenues, but they have not earmarked that extra revenue for any specific purpose.

31124. How much additional revenue have they been able to get in that way?—It is very small indeed, only a few thousand rupees. The total increase in revenue, as far as I remember, was well under Rs. 10,000.

31125. Was that increase from 1 anna to 1½ annas in the rupee?—I think it was a question of some pies increase.

31126. So that, they have not shown their desire for better schools by paying any additional sum towards it?—They do not like to tax themselves very much.

31127. Do you know how many districts in the Province have levied anything additional for the purpose?—I could not say. As a matter of fact, I think in Berar they have definitely levied an extra school cess in several district.

31128. Could you find out and let us know*?—I could; I think it will be in the last District Council Report.

31129. This increased cess is under your recent Local Self-Government Act?—Yes.

31130. *Sir Ganga Ram:* Are the schools free to agriculturists?—Yes.

31131. They do not have to pay any fee?—Not in primary schools.

31132. When do they begin to pay fees?—They pay a small fee (I could not tell you the amount) in the Anglo-vernacular and vernacular middle schools.

31133. In primary schools they do not pay anything?—No.

31134. *Sir Henry Lawrence:* Since when?—So far as I know, they have never paid any fees for primary education.

Sir S. M. Chitnavis: For primary education, they do not have to pay any fees even in Nagpur.

31135. *Sir Ganga Ram:* When you spoke of the scarcity of roads, did you refer to *kutcha* roads, or fair weather roads?—The village tracks in a great many cases are very bad, and they cannot be used once the rain has started. What I was really referring to was made roads. They need not necessarily be metalled. In this Province, we make a lot of roads out of murum or gravel. For purposes of ordinary traffic murum roads are very often suitable, if the traffic is not very heavy.

31136. Whether they are metalled or unmetalled, are they sufficient?—No.

31137. It has been represented to us that in some places the people have to go 60 miles for disposing of their produce?—Yes, and in some places they cannot use wheeled transport at all.

31138. Are the markets not so near that they can go to them?—I can give you an example from which you will see what I mean. Rice from Bilaspur is very largely brought up to Katni in the Jubbulpore district by *banjaras* on bullocks.

31139. What is the distance?—About 100 miles.

31140. Is there no railway serving the district?—There is a railway from Bilaspur to Katni. I have seen *banjaras* with their herds of cattle going down to Katni.

31141. Is it due to the high railway freight?—It is due to the difficulty of getting the produce from the interior of the Bilaspur district to the railway. I believe there is only 50 miles of metalled road in Bilaspur district.

31142. The railway is not very popular for goods traffic?—I think it would be popular, if you could get the roads there.

31143. There may be objection on account of the high railway freight, or there may be trouble by the railway staff?—No. I do not think that is the reason. It is due to the absence of roads.

31144. Otherwise, how can pack animals compete with the railways?—I do not know. The cultivator probably gets less value for his produce by having an extra middleman. If he could send his produce to a market near his village,

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*The cess has been imposed by the District Council, Raipur, in two villages from the 1st October 1925, and in nine villages from the 1st October 1926. The total amount raised in the former villages is Rs. 78, and the assessment for the latter villages is Rs. 769. The cess was also levied by the District Council, Damoh, temporarily for one year in 1924-25 and the total amount raised was Rs. 7,173-13-0.

and if there were a metalled road from that market to the railway station, I think the cultivator would get a much better price.

31145. There is not a metalled road from Bilaspur to Katni?—They go across country, more or less. That is the point of the *banjaras*, that they can go across country.

31146. *Sir Henry Lawrence:* Does the *banjara* buy the stuff from the cultivator?—I think so. I think he is probably financed to some extent by traders in the market he eventually comes to. The *banjaras* take down salt and sell it, and I think they do a certain amount of exchange also.

31147. The cultivator does not accompany the *banjara* caravan to sell his produce at a distant market?—No; the *banjara* buys it; he may be financed by a trader.

31148. *Sir Ganga Ram:* Is your Division well served by railways? Are there any branches under contemplation?—I think we are fairly well-off as regards railway communication, but the trouble is feeders to the railway.

31149. Is there lack of feeders?—There is lack of feeder roads; I do not mean feeder railways.

31150. Are there any railways under contemplation in your Division?—No, I do not think there is anything at all like practical politics.

31151. You say that metalled roads should be made from loans. How are the interest and maintenance charges to be met? Would you be in favour of levying tolls?—It might be done where one had to construct a large and expensive bridge, for instance.

31152. Would you be in favour of levying tolls to pay for the interest and maintenance charges?—If it were for a bridge over the Nerbudda for instance, it is one of the things which might be done.

31153. That is only for getting across the bridge. Supposing there is no bridge, but only a metalled road of 60 miles in length, would you be in favour of imposing a toll at certain fixed intervals to pay for the interest and maintenance charges?—No, I should not make that the exception.

31154. How is the interest to be paid in that case? The interest will then be a burden on the land revenue?—Yes, I think it certainly should be so. I think the landlord will benefit very much more than anybody else by the extension of communications, and I think he can very well pay for it.

31155. *Sir Henry Lawrence:* Have you no road tolls in this Province?—No, except in the case of ferries. In certain cases where there is no *pucca* bridge across a river we build a temporary bridge in the cold weather, and very often there is a small toll in connection with that.

31156. The system of levying tolls on roads is not in force here?—I know of no place where it is in force.

31157. *Sir Ganga Ram:* Are there many absentee landlords in this Province?—Yes.

31158. Do they let their land to tenants on cash rent or *batai*?—The tenants hold their lands at rents which are fixed in cash at the time of the settlement, and which cannot be altered during the term of the settlement.

31159. At the time of the settlement you fix the rents the tenants are to pay?—Yes. The tenants' payments are fixed. What it really comes to is that the tenant is to some extent a proprietor with a limited right.

31160. *Sir Henry Lawrence:* Has he as good a right as a ryot in a ryotwari part of the Province?—No. There are three principal classes of cultivating tenure: the plot proprietor, of whom there are not very many; who has an absolutely transferable right, like the ryot in Berar; the absolute occupancy tenant, who has a limited transferable right, and can transfer on giving notice to his landlord and on payment to the landlord of a certain transfer fee, and the occupancy tenant who can lease his land only for a year at a time, and can transfer to anyone who would inherit his land if there were no nearer heirs, but who must otherwise get the permission of his landlord and pay the landlord a fee.

31161. *Sir Ganga Ram:* Have you any figures to show whether your Division produces its own food?—No.

31162. Have you to import food?—Except in time of famine I do not think we import any food except a little rice.

31163. But rice is the principal food?—We grow a very large quantity of wheat, and in my Division the principal food is wheat; rice is a supplementary food.

31164. Have you any figures as to that?—No.

31165. Could you provide us with figures, giving the population and the quantity of food produced?—They could be worked out, but it would mean a great deal of time and trouble.

31166. Do you often suffer from scarcity of fodder?—Not in my Division.

31167. When you do, what measures do you take?—Do you mean if there was a scarcity in the villages?

31168. Yes. Do you keep fodder reserves in any form?—No.

31169. There is no necessity for that?—I do not think so.

31170. Are any of your roads in the charge of the Public Works Department?—Yes.

31171. All the metalled roads?—No, the main roads, such as the Great Northern Road, which is the principal one in this Province.

31172. Are roads in this Province divided, as they are in the Punjab, into main, arterial and minor roads?—It is not laid down in so many words. We have transferred roads and provincial roads.

31173. Is there any law or principle according to which roads of a certain class are in the charge of the Public Works Department and of another class in the charge of the District Boards?—I do not think so. The general idea is that main lines of communication are kept up by the Public Works Department.

31174. What proportion of the revenue is given to the District Councils?—I think it is now 5 per cent, though I am not absolutely certain. It is either 5 or 6 per cent. It used to be 6¼ per cent, but I think it has now been reduced to 5 per cent.

31175. Do you levy any cess for roads?—This cess on the land revenue is the District Council's cess, and is given to the District Council chiefly for roads and education.

31176. Is no proportion fixed as to how they shall spend it?—Not now. There used to be.

31177. Has that been changed since the Reforms?—No, before the time of the Reforms. The District Councils now have absolute discretion in the use of their funds.

31178. Do you think *taccavi* reaches the cultivator without some of it being pilfered? Some witnesses have represented to us that if Rs. 500 is granted only Rs. 400 will reach the cultivator?—I think there is very little leakage in this Province. I have never come across a case.

31179. Is *taccavi* given for new wells?—Yes, to a certain extent I have known of cases.

31180. Are applications for *taccavi* decided speedily?—Very quickly, as a rule. When there is a great demand for loans, the Tahsildar takes the money on tour with him and hands it out in the villages.

31181. Are you in favour of peripatetic dispensaries, both for human beings and animals?—Yes.

31182. Is there that system here?—Not for veterinary work. We have a number of such dispensaries for human beings which, I think, are doing a certain amount of good; at any rate they are making more advanced methods of treating diseases better known. It is a question of time, but I think they are doing good.

31183. Is there any system here such as is in vogue in Madras, of giving subsidies to private practitioners to settle in rural areas?—We are just starting that; we only began this year. I have not yet come across instances of it.

31184. Have you in mind any extensions of irrigation schemes?—No.

31185. In your opinion, can irrigation be improved in any way?—I do not know very much about irrigation, but I think in my Division it would be too expensive for public money to be spent on it, though I have not yet got figures to prove that. I refer to irrigation on a big scale; small irrigation works may be made to pay.

31186. It has been represented to us that sometimes crops fail simply for want of one watering. Does that happen in your Division?—It might conceivably do so; I could not say off-hand.

31187. In those cases, of course, irrigation would pay?—It would pay, perhaps, for one year out of twenty. One usually reckons that once in ten years a crop will go wrong.

31188. The irrigation people say it happens more often than that?—I refer to a bad failure.

31189. You refer to rope making: is that done as a trade or are the ropes simply made for use at home?—For home use, as far as I know.

31190. It is not a subsidiary occupation conducted for trade?—No; it is certainly not an occupation subsidiary to agriculture.

31191. They make rope for their own bullocks, and so on?—Not to any great extent. Probably the man who makes rope will sell a little, but it is not common for cultivators to make rope as a subsidiary occupation.

31192. Do the cultivators here have plenty of spare time?—Any quantity of it.

31193. During what period?—In the wheat-growing districts they put in their wheat in October, and after that they have very little to do until it is ripe. That means they have three or four months with little to do.

31194. They have nothing to do after putting in the seed?—We call wheat a lazy man's crop. It is different in the cotton country.

31195. Our people who grow wheat have not a minute's time to spare. They have got to look after fodder and other crops?—That is not the case here.

31196. *Sir Thomas Middleton:* Does the prosperity of the people vary a great deal from district to district in the Central Provinces?—Yes.

31197. Where that is the case, in many countries attempts are made to level up the quality of cultivation to that of the best district. What are the prospects of doing that in this Province?—There are climatic differences which affect the matter.

31198. I am going to ask you to analyse the difficulties. You have mentioned climate, and, I suppose, would add soil. These are natural conditions which limit the process. Apart from these, what other difficulties are there which could, perhaps, be overcome?—I am afraid I do not quite follow the question.

31199. I want you to think of this Province as a tract in which cultivation is relatively well advanced in certain areas and relatively very poor in others. If you set yourself the task of levelling up the quality of the cultivation to the best standard existing, what difficulties would you encounter?—The very first would be lack of money.

31200. You mean that in certain districts the cultivators are relatively well off, whereas in others they are not?—Yes, relatively; perhaps one might say that.

31201. But the lack of money depend upon something else. How is it that one group has money in their hands, while the other group has none?—The agricultural history of the tract.

31202. Is it largely a question of race?—It is to some extent; but that factor is going out. Ordinarily, the aboriginal is not a good cultivator, but in most places he has gradually been pushed off the good lands.

31203. Would there be much in that, for example, to account for the differences which one finds between Berar and Chhattisgarh; would race be an important factor here?—I think probably it would. It is rather hard to condemn a whole tract in that way. But there is no doubt that the Berar cultivator is a very enterprising fellow and the Chhattisgarhi is not. But I think there are probably climatic reasons for that.

31204. *Sir Henry Lawrence:* Are there reasons of public health?—Yes.

31205. Malaria?—Malaria, and there are a variety of other diseases too. The Chhattisgarhi is a bad physical specimen.

31206. *Sir Thomas Middleton:* You have indicated that health is one of the factors. What about the ordinary food of the people in the two areas?—The Chhattisgarhi's food is extremely meagre. I have little or practically no experience of Chhattisgarh. I have been there for a short time and that is about all. But the land is bad, the people are largely unhealthy and for that reason their physical standard is low and they have not got a high standard of living; they live largely on rice and nothing else.

31207. Is there anything in the educational position within the two areas that would account for the difference?—The Berari being more enterprising, he is more advanced as regards education. I cannot speak very well of Chhattisgarh.

31208. So far as your knowledge goes, it is mainly a question of climate, you think?—The climate is one large factor; there are others; I do not know if you include unhealthiness in climate.

31209. You mentioned the condition of the people. Are there any differences in the marketing conditions in the two areas or in any other two areas that would suffice to constitute a great difficulty in improvement?—I do not quite follow what you mean.

31210. What I mean is this. Suppose the markets in Berar are satisfactory; I want you to indicate whether there are any other areas which are held back in comparison with Berar by poor marketing facilities?—In general I should think that the proposition is correct. The Berar marketing conditions are better than anywhere else; there is no doubt about that. I should think you would have to improve the marketing conditions in the Central Provinces, but I do not see how you can do it unless you improve the communications.

31211. Now if you take the different districts in the Province, is there much difference in the constitution of village population?—By that, I mean, suppose in Berar you find about 60 per cent of the householders in a village are also land occupiers; in other districts would you be likely to find a very much larger proportion occupying land or not?—Again I do not quite follow you.

31212. What I want to get at is this. In a district like Berar, for example, we may find, in a particular village, 60 or 70 per cent of the villagers or heads or houses occupying land and the rest employed as labourers. Now do these conditions of land holding and labour vary widely throughout the Province or is it a general thing that you find about two-thirds of the population engaged as cultivators and one-third in labour?—I should think it varies extremely.

31213. From your knowledge of the Province, which are the areas in which the labourer is most abundant?—As compared to the cultivator?

31214. Yes; that is to say, where the cultivator hires his labour?—We get from the plateau districts a good deal of migratory labour which would indicate that the labour there was numerically stronger, that is, Seoni, Chhindwara and Betul districts especially.

31215. What I wanted to get at was whether although conditions may vary largely from village to village, there is any one compact tract where there is a good deal of landless labour and other tracts in which all the villagers are cultivators who do not employ hired labour?—No; I cannot say that either condition is marked characteristic of any tract.

31216. It varies from village to village; in some villages you have a low percentage of hired labour and in others a large percentage?—Yes.

31217. In the cotton districts you will find a larger proportion of hired labour?—Yes; we want more in the cotton districts.

31218. There must be more in Berar as compared with Chhattisgarh for example?—Yes.

31219. Is any part of your district a cattle-breeding tract?—No; there is no organised breeding.

31220. Is it a cattle supplying district?—Does it supply cattle to the other districts?—No; none in the Jubbulpore Division at all.

31221. They have to purchase from their neighbours?—A great deal of cattle come from the north. A certain number of people in Jubbulpore buy but they nearly all go down to the south.

31222. We were told that they come from the north; I thought it was from the Jubbulpore Division?—No; from still further north.

31223. You have no tracts in which cattle-breeding is an important industry?—No; there used to be. I think I said in reply to the Chairman that there was once such an industry in Mandla; but I think it is dying out to a great extent

31224. *Sir Henry Lawrence*: What is it due to?—The people who owned the cattle lived at a distance, and they could not control the herds, that is what I was told. A lot used to come down from Chhindwara to the forests of Mandla and Balaghat, and the owners of those herds told me they never could control the graziers who used to report the young stock as having died or been killed by tigers whereas they had actually been sold by them; eventually the thing did not pay and so they gave it up.

31225. It is not due to the forest restrictions?—No; I do not think so.

31226. *Sir Thomas Middleton*: What, in your opinion, is the first method by which you might hope to improve agriculture in the Central Provinces?—Put more money into the cultivator's pocket. If you gave him more money he could improve his system, improve his methods, improve his implements, improve his seed and so on.

31227. If more money is to go into his pocket, he should have more to sell?—You can do that by giving him better prices for his produce.

31228. Apart from prices which he cannot control, how is he to get more to sell?—That is one thing which we can improve. I thought you wanted to know what we could do to get him more money.

31229. You say you want to put more money into the cultivator's pocket. The cultivator himself cannot control the prices. You can only put more money into his pocket by increasing what he has got to sell?—We can help him a bit from outside.

31230. What do you think is the most obvious way? What about his cattle? I thought you could have put the condition of the cattle forward as being in importance first?—You mean that he could improve the condition of his cattle?

31231. Yes?—Yes, he could. The difficulty really about cattle over the greater portion of this Province is what I have said in my evidence, that the good cattle are ruined by the enormous number of useless cattle which eat up the food available in the village.

31232. That is one thing; but there are other things that ruin them besides. You pointed out, for example, that as a rule cows are not stall-fed at all. Even in Berar where they take much more care, we ascertained yesterday from villagers that they only feed grains to a cow if it is giving milk. How can one expect good cattle if cows are not properly fed?—I do not know; that is the whole difficulty, that the cattle are not fed properly.

31233. You also point out that in your own district there is any quantity of fodder available, but that nobody will pay for it?—Not only that; I do not think he will take the trouble of going and getting it.

31234. How are you going to remedy that state of affairs? That is what I want?—We have tried very hard; we have tried by giving them easy terms and we have not succeeded in making them do anything.

31235. Assuming that the cultivator were better educated, do you think that would help to solve the difficulty?—It might I suppose. If he used his brains a bit more, he might see the value of these things, but that would be a long business.

31236. *Mr. Wills*: As regards the question of subsidiary industries for cultivators is it not a fact that there is a tremendous prejudice in this Province against the keeping of fowls?—I believe there is amongst certain castes.

31237. Is it not a fact that in 1921 all the Gonds slaughtered their fowls?—Yes, under the influence of some of the local agitators, they were told to slaughter all their fowls.

31238. Does it not cast a social slur on them to keep fowls?—Yes, I think it does to a certain extent.

31239. And if they wish to raise themselves in the social scale, is it not necessary that they should give up keeping fowls?—Yes.

31240. *Sir Henry Lawrence*: Is that amongst the Gonds only?—No, amongst all the classes. It was due to a regular propaganda on the part of the local agitators.

31241. *Mr. Wills*: And keeping pigs is on the same footing?—Yes.

31242. And if a man were to take to basket-making, there would be a strong prejudice against him?—Yes.

31243. Then as regards the question of village roads. Is it a fact that there is an extraordinary difference between the north of the Province, the wheat growing tract and the rice and cotton growing tracts as regards the ordinary cart tracks?—I believe so. In the wheat-growing tracts, the village roads are practically impassable in the rains.

31244. Is it not a fact that there are hardly any cart tracks in the wheat-growing tracts?—Yes, it is not worth while having a cart track across heavy soil because you cannot use it in the rains.

31245. As regards the difference between Chhattisgarh and Berar, that is due, is it not, very largely to the historical difference between the two areas, that is to say, was not Berar a prosperous Province under the Moghul Emperors for many centuries, whereas Chhattisgarh has been a land-locked jungle tract?—Yes, that is perfectly true. Chhattisgarh was very jungly and very land-locked up to quite recent times.

31246. And the railway first entered Chhattisgarh about 1890 whereas Berar has had it since 1865 or 1867?—Yes.

31247. The *Raja of Parlakimedi*: For the required amount of agricultural knowledge, do you not think that the Revenue Inspector would be the best agency for popularising improved methods of cultivation among the ryots?—He has got too much to do in his own work. I should not like to have my Revenue Inspectors turning out as amateur teachers of agriculture.

31248. Do you not think that it would be a useful thing for the Revenue Inspector to gain some amount of popularity among the ryots by talking about the general condition of cultivation and how to improve it and so on?—It might be of use, but I cannot say that there is very much in that.

31249. During his probationary period, for instance, would you not like the Revenue Inspector to get a certain amount of agricultural training?—It would not do any harm, but I do not think that it would do very much good.

31250. But if you had a man with such agricultural experience, would you not like to have him as your Revenue Inspector?—If I had had two candidates for a revenue inspectorship, of whom one knew a lot about agriculture and the other practically nothing at all, I should certainly prefer the agricultural man. But I think that in the actual carrying out of his proper work with regard to land records the agricultural raining would be of very little use to him.

31251. No, I was referring to the assistance which such a man would render in improving the general conditions of the ryots?—I am afraid I have never thought of using a Revenue Inspector for that sort of work.

31252. As regards the lack of roads in the Jubbulpore district, what is the chief obstacle?—Lack of money.

31253. Or is it because the Local Boards do not take enough interest in them? As a matter of fact they do not take sufficient interest, but that is not the reason at all. It is simply because of the lack of money.

31254. Can they not levy a special cess for roads?—They can levy a special extra cess on the land revenue in aid of their general funds and if they like they can earmark that for roads. But as far as I know that has never been done, although there is no reason why they should not do it.

31255. *Sir Henry Lawrence.*—Who would pay the cess?—The landlord, or malguzar: he can pass on a fixed proportion to the tenant; it is not quite half.

31256. *Mr Wills*: It is one-third?—Yes.

31257. *The Raja of Parlakimedi*: Cannot Local Boards apply for Government aid?—Yes, they can apply for it.

31258. Have they applied in that district?—They are always asking for more money. As a matter of fact, the object of every District Council is to get an extra slice of the provincial revenue.

31259. In that particular area there has been an application made?—Not by way of specific grants for the improvement of communications.

31260. In answer to Question 4, you say that you would like to see the research work treated as a central subject. Would you like to have it controlled just as the Reserved subjects are being controlled?—It does not matter very much as long as the financial side is safe. The trouble is that if you have an important piece of research work going on and you are starved in the way of funds, there is an end to it.

31261. Is the money reason your chief reason, then?—Yes.

31262. Under soils, you say that a certain type of grass is encroaching on cultivable areas and the Agricultural Department are trying to put it down. Are there any annual reports dealing with this?—Yes, the annual reports of the department contain an account of what is being done. As a matter of fact, they have not done a very great deal of mechanical ploughing; it is a new development.

31263. What was the area saved from the encroachment of *kans* grass last year?—I could not tell you; but it is very small, and they are just getting landlords to pay for it. The more enlightened landlords only will pay as it is an expensive job.

31264. What is the method adopted?—Ploughing by steam tackle.

31265. Is this grass confined to certain localities or has it spread all over?—It only affects the best soil; irrigation kills it to a certain extent. But I am not an agricultural expert.

31266. Are you satisfied with what is being done for improving the strain of the seed?—The department is doing what it can with the money at its disposal, and I must say that it is doing excellent work.

31267. How many depots for distribution have they?—The number varies immensely. I could not tell you off-hand as I have not got the figures with me. There are different stages of development. Private individuals who will undertake to keep the seed pure are given seed in order to start private seed farms and where you cannot get suitable people for that the department has its own seed farms. The system varies in development from district to district. But where they have put out pure seed, it is undoubtedly to the interest of the cultivators.

31268. And is the cultivator easily able to secure his seed?—The ordinary tenant might find a little difficulty in getting it; there is not such a lot available. The small man, I think, would find it a bit difficult to get pure seed. At present, we are starting a system of giving loans of pure seed under the Agriculturists' Loans Act.

31269. What is the method he has to adopt for securing the seed? What is the way of applying for it?—He could apply now, in any district where the system of lending seed is in force, to the local Agricultural Assistant, or if there was a private seed farm he might buy his seed from this private seed farm.

31270. *Sir James MacKenna.*—What are your views as to the position of an Agricultural Assistant working in a district in relation to the Deputy Commissioner or the Sub-Divisional Officer?—Hitherto it has not been very well defined but I should like to see him to some extent an assistant to the Deputy Commissioner, recognised as such. The only trouble about that is that, for technical purposes, he must be under the department; the Deputy Commissioner cannot check his technical work.

31271. That is a very difficult problem?—It is a very difficult problem.

31272. Do the diaries of Deputy Directors go through the Deputy Commissioner?—I do not think they go through the Deputy Commissioner; I have not seen any in recent years.

31273. Have you any irrigation problems of importance in the Jubbulpore Division?—Not any that I am familiar with. The difficulty about irrigation, from what I have been able to see there since I have been in the Division, seems to me to be that it is very expensive.

31274. It is probably not worth the money?—I think it is not worth the money. It is worth it in certain cases, but in the great majority of cases it is not.

31275. You have not taken up any concrete instances yet in detail?—I went into the figures of one irrigation scheme, but there were a lot of diverse factors in it.

31276. *Prof. Gangulee:* In answer to Question 25, you make a reference to several economic surveys of typical villages, and say that the cultivating class is about to be ruined, and there is no profit in agriculture?—I do not say that.

31277. You say that from a perusal of these various economic surveys, that appears to be the conclusion?—I can think of three that I have read, in which that is the conclusion.

31278. From your own impression, what view have you been able to form with regard to this matter?—I do not think the cultivator is going to be ruined.

31279. Do you base your views on any particular enquiry that you yourself have made?—Yes. I have made considerable enquiries, as Settlement Officer, into the amount of sub-rent which can be got for land, and if the cultivator was going to be ruined, there could not be that amount of margin left.

31280. What is the value of cultivated land here per acre? Has the value increased?—Expressed in terms of money, it has of course increased. That is rather a misleading thing, because value in terms of produce is really the only way you can compare.

31281. Supposing a cultivator wanted to sell his land, what price would he get per acre of cotton or rice land?—I could not tell you.

31282. What is your impression?—It varies from soil to soil so much. I can give you some figures from which you can make a rough calculation. The rent, I take it, might be put at 10 per cent of the gross produce, and a man will pay 100 times that. I have frequently seen that in good advanced tracts; I do not say it is so in backward tracts.

31283. Can you tell the Commission if there is any increased tendency for the consumption of intoxicating liquor and drugs?—I do not think there is any tendency to increased consumption. I should say it is rather the reverse, since we have put up the price.

31284. Of course your excise revenue has increased a great deal?—This year it has dropped heavily.

31285. I find that the total excise revenue for the financial year 1924-25 was estimated to be Rs. 150 lakhs, and there was an actual increase of Rs. 15 lakhs?—Yes, but we have had a blow this year; it is Rs. 25 lakhs less than last.

31286. In answer to our Question 6, you make the statement that a great number of the smaller cultivators in the country are never very far from the margin of subsistence. Do you observe any significant improvement in that direction; is there any change for the better?—I cannot say that I have observed any improvement. There will always be a certain proportion living on the margin of subsistence, especially in the poorer villages.

31287. On the question of agricultural education, you attach a great deal of importance to suitable teachers?—Yes. That is the crux of the whole situation.

31288. You have in Jubbulpore a training college. Can you give the Commission your impression about it?—I do not know very much about it. I think you had better ask educational authority about that.

31289. With regard to the question of settling agricultural graduates on land, would you approve of the suggestion to offer special concessions and grant unassigned culturable land to agricultural graduates?—It might be tried as an experiment.

31290. As a revenue officer, would you approve of that suggestion?—There is not very much land of any value in the Province to give to these people.

31291. There is land that could be reclaimed?—If they would take it up, it would be a very good thing to do.

31292. On the question of complete co-operation between the officials of the Agricultural and Revenue Departments, you are of opinion that revenue officers command considerable influence over the ryot?—Yes.

31293. How you bring about this co-operation that you would like to see?—I have stated that it is a very difficult question, but in course of time I think we shall probably be able to work out a system. The Deputy Commissioner, as some Deputy Commissioners do, may take the Agricultural Assistant round on tour. If the Sub-Divisional Officer and the Agricultural Assistant can both spare the time to tour together, a good deal could be done that way, but it is a difficult thing to do.

31294. I was not thinking of the Deputy Commissioners taking an interest in it. I was thinking of the actual revenue officers who come in contact with the culivators. I was thinking of the Tahsildars and Revenue Inspectors?—We all come into contact with the cultivators.

31295. But the Tahsildar comes into greater contact with the cultivators?—Yes.

31296. Do the Tahsildars or Revenue Inspectors take part in the Provincial Board of Agriculture?—Certainly not.

31297. Would you like to see a short course in agriculture for all these revenue officers of the lower grade, the Tahsildars and Revenue Inspectors?—I should like to see the Tahsildar have the benefit of the short course, but as I have already stated in answer to a similar question, I do not see very much gain to the Revenue Inspector. The Tahsildar might be put through a short course, and some good might be done in that way.

31298. By offering a short course to these men in the Nagpur Agricultural College?—We might do so. I think last year and the year before last we did give a short course of instruction to revenue officers, which did some good. I suppose it would do some good to give the Tahsildars some training in that way.

31299. In that case they would be able to co-operate with the demonstrators of the Agricultural Department?—I should like to say one thing about it, that in course of time, for these appointments, we shall be able to get graduates in agriculture of the University.

31300. Would you prefer agricultural graduates to ordinary arts graduates for these appointments?—Other things being equal, and provided the men possess good general mental attainments, I should prefer them.

31301. You have District Agricultural Associations, Tahsil Agricultural Associations and Circle Agricultural Associations. Could you tell the Commission how these various associations are functioning?—I have not really had very much experience of them of late years.

31302. Are the roads in this Province mostly under the control of the District Councils, or are they under provincial control?—it is rather hard to say. I do not know what the mileage really is. I think one might say that the great majority of the roads are under local control now.

31303. Government has recently withdrawn about 160 miles of roads from the management of local bodies?—I do not krow the exact mileage, but they have had to take back certain of the roads.

31304. Do you think that the retransfer of the roads to the Provincial Government has improved their conditions?—I have not seen the roads, but I should think it would, to judge by the other roads one sees.

31305. You say that the system of *taccavi* loans is inelastic. What suggestion have you to offer for making it elastic?—I do not think you can make it very elastic, for this reason that you are responsible for public money and you cannot risk it. Of course, we lose a certain amount, because remissions have to be given, but you must make the distribution of public money to some extent inelastic.

31306. You are not, it seems to me, in favour of the extensive use of *taccavi* whereas we had a written statement from the Deputy Director of Jubbulpore Circle in which he says that *taccavi* loans should be of great assistance to cultivators?—I think they are of great assistance to the cultivators. All that I meant was that you cannot push it too hard. We do give out quite a good deal of money now, and the Agricultural Department are helping by seeing that it is spent on proper objects.

31307. Would you like to see co-operative societies undertaking the work of giving *taccavi* loans?—Certainly not. I think it is not part of their function.

31308. In answer to the Raja of Parlakimedi, you stated that a certain amount of land in the Central Provinces is being reclaimed by mechanical ploughing. Is there a demand for such reclaimed land?—It is not a question of waste land being reclaimed; it is a question of land which is already occupied being reclaimed; it belongs to people already.

31309. My impression was that a considerable area went entirely out of cultivation?—There is a certain amount of land in certain parts of the Province which has not been cultivated for many years, but it is property belonging to somebody. The Agricultural Department do not plough it up for nothing; they charge the owner for it.

31310. You told us that the veterinary services are not quite popular?—I did not say that.

31311. You said that the local bodies do not take adequate interest?—That is a different thing.

31312. I find from the report that was submitted to us that the number of dispensaries is increasing, and the number of cases treated is also increasing?—I think it is so, as far as I know.

31313. But you say that the District Councils, under whom the veterinary dispensaries have been placed in this Province, are generally completely apathetic in their regard?—Yes, that is right enough.

31314. Then, how do you account for the increase in the number of cases treated? In 1901 there were 29,000 cases treated, and in 1922—25 there were 429,000 cases treated?—Yes, that is all right. The department is working hard, but that does not show that the District Councils are trying to help.

31315. But the cases generally come from areas within the jurisdiction of local bodies?—The cases do not come from the local bodies. They come from the local population, which is a different proposition.

31316. There has been the same increase in the number of castrations?—That is largely due to the introduction of improved means.

31317. Is it due to the introduction of the Italian method?—Yes.

31318. The people are appreciating the benefits of the veterinary services?—The people are getting, by degrees, to appreciate their work, but the local bodies do not try, as they could, to help the department; I am quite certain they do not. I have seen any number of veterinary dispensaries housed in a dirty little room in a *serai*, whereas the District Council could very well afford to give them better accommodation. The Veterinary Assistants do their best when they go out on tour.

31319. Do you think District Councils could be encouraged by propaganda to take more interest in the work?—I do not think propaganda will help much. It may help the work of the department in the villages. It requires education to get the more educated classes to take an interest in it; they do not do so now.

31320. What is your view with regard to the introduction of legislation to protect cattle from outside infection?—As I have said, I do not know of very much that can be done in that direction. There is no doubt that herds of cattle coming into this Province do bring in disease. It has several times been suggested that something should be done to have these cattle examined on entry and to prevent the entry of infected cattle, but up to the present the practical difficulties in the way have made it impossible to do anything.

31321. Is there any draft Bill before the Council about this?—No, and I do not think there ever has been.

31322. You say you do not believe in the artificial introduction of subsidiary industries. Has Government made a survey of possible rural industries?—One was made many years ago by Mr. (now Sir) Ernest Low.

31323. What conclusion was arrived at?—I forget. It was a long time ago.

31324. You have an Advisory Board of Industries in this Province?—Yes.

31325. What is its function?—I do not think it is concerned with the starting of subsidiary industries; it has to do more with the development of existing industries. It controls the Boiler Department, factory inspection and so on.

31326. You are of opinion that the prejudices of the people are a serious handicap to the establishment of rural industries?—Yes.

31327. In the seventeenth and eighteenth centuries similar prejudices prevailed throughout Europe?—I dare say.

31328. Under the new Self-Government Act of 1920 each member is required to reside in his constituency, the idea being to keep the members more in touch with rural problems. What has been the effect of this provision ?—I have not so far observed that it has had any particular effect. I was speaking to a member of a Local Board the other day about the condition of the road that we were travelling along, which was quite close to his village. I asked him why he did not take steps to see it was kept in proper order. He said he would like to, but no one else on the Board would listen to him, or let him have anything to do with it. I said that did not seem right, and he agreed it was not.

31329. You have formed the impression that the members do not take sufficient interest in rural matters? That is putting it a little too strongly. It is a question of translating their interest into action. They probably do take an interest; most people take an interest in their own affairs.

31330. *Mr. Calvert:* On the question of rural education, we are faced with two difficulties: leakage between the bottom and top classes in primary schools and the lapse into illiteracy after leaving school. What do you think is the real reason for the leakage between the first and fourth classes? I have spoken to people in the villages about that, and I think it is almost entirely due to the lack of interest shown by the parents in the education of their children. There is also a certain amount of leakage due to the fact that the children are employed in odd jobs about the village.

31331. Do you think the latter reason is an economic one? Is it that they cannot afford to leave their boys at school?—I think it is more due to custom. The amount of work done by these boys is comparatively small.

31332. Do you attribute that to the laziness or apathy of the parents?—Apathy. They do not care about education.

31333. It is not that they cannot afford to leave their boys at school?—Not in the majority of cases.

31334. In your note you say the teacher is almost always a half-educated Brahmin with no interest whatever and no knowledge of agriculture. Do you think that fact is responsible for the leakage? A more inspired teacher might keep the boys at school?—That is possible, but I do not think it has much effect.

31335. A teacher more in sympathy with the rural classes might be able to bring pressure to bear on the parents? If a teacher had local influence he could get the parents to send their boys to school?—That is quite true. Formerly, the Tahsildars and local revenue officers used to do a good deal of school attendance work, but they have now been discouraged from doing it, because it is not their job; the schools being no longer under Government it was considered the local bodies should undertake it. Teachers have complained to me that they have to spend a lot of time in trying, usually unsucessfully, to get the boys to come to school.

31336. Have you in your Division any compulsory primary education?—Not yet.

31337. On the question of relapse into illiteracy, do you think the absence of any good modern vernacular literature is one of the causes of this?—Probably. All they have to read in the village is books like the Ramayana.

31338. That is not always available in modern vernacular, is it?—No.

31339. The idea of this education is to uplift the people and give them a wider outlook. Do you think the general squalor of the villages keep people from going in for education?—I cannot say.

31340. The fact there is a school in a village does not mean the village is cleaner and more sanitary and has a better water-supply and so on? The presence of a school does not react on the welfare of the village?—It is difficult to say.

31341. A charge commonly made is that education leads a boy away from manual labour. Do you provide water-carriers and sweepers in your schools?—I do not think we do in the primary schools.

31342. Do the boys get their own water?—I think so. I have never seen a water carrier in a primary school; there may be some.

31343. There was an effort made is this Province about twenty years ago to get rid of rural debt by some method of conciliation?—Yes.

31344. What was that?—I never had any experience of it, but no doubt the proceedings are available somewhere.

31345. It has been described to us as a failure?—My impression is that it was not a failure; it might have done more good, but it did do some good, at any rate in certain districts.

31346. Do you think the people will ever be able to get rid of this burden of debt from what they can save from cultivation alone?—I think they could, if they were more thrifty. As I have said in my note, there is a tendency for a man who gets a good crop to spend the extra money on some *tamasha* in his family. If they would only save that money they might get rid of their debts, or at any rate of a good deal of them.

31347. By steady thrift?—Yes, I am sure of it.

31348. You are averse from restricting the right to transfer holdings?—I am, in well-developed tracts, such as the Nagpur country.

31349. Do you think restrictions on alienation do in fact serve to withhold from the land finance which would otherwise be available?—Yes. There is one way in particular in which I have always held the system is bad for the land. The fine on transfers which I have mentioned amounts to a considerable sum in a great many villages, and that money does not go back into the land to any great extent. I think that is one of the chief evils of the present system. Although a certain number of tenants may be saved by these restrictions on transfer, the chief result is extra profit for the landlord which does not, in a great many cases, go back into the land.

31350. As far as I recollect, witnesses who have answered our question as to the causes of indebtedness have mentioned the purchase of land, but never land improvement?—I have not analysed the causes of indebtedness since I did settlement work many years ago, and I forget what the proportions were, but I think one of the causes was the spending of money on things like embankmets and so on.

31351. *Prof. Gangulee:* Do you think increased prosperity is a cause of debt?—No.

31352. *Mr. Calvert:* On the question of the utilisation of cowdung as fuel, do you think one of the difficulties is that they have got used to one method of cooking and do not like to change the method of cooking?—I should think that might have a considerable effect.

31353. We have been told that the allotment of *taccavi* is very small in comparison with the sum required. Is there any difficulty here in getting the money required?—I do not know of any; at any rate it is rather hard to compare it with the demand.

31354. But you can meet the demand from your Deputy Commissioners?—Yes, I can; I have never been refused any allotments that I asked for.

31355. On the question of damage to crops by wild animals: Does the distribution of gun licenses prove at all effective?—It does in some places. The chief thing you want to destroy is the pig and the pig is not a very paying animal. The man who gets the crop protection license may kill a few deer and sell the skins, leaving the pig alone; but that is not what you want We had a system by which we insisted on every man producing 4 boars' tusks every year as a condition of having his license renewed and I think that system worked quite well.

31356. *Sir Henry Lawrence*: Is it still in force?—Yes, in most of the districts.

31357. *Mr. Calvert*: Is the eastern half of your Division a rice eating tract?—A good deal of rice is grown in the Seoni district, but it is not a rice tract; my Division is not a rice tract.

31358. You are just on the edge of the rice tract according to the map?—Yes.

33359. Is there any difference between the physique of the rice eating population and that of the wheat eating population in that small area?—Not in that small area, because most of the people in my Division are not rice eaters; their principal food is wheat. There is a certain amount of rice too, but I think the principal food of the majority of the population is wheat.

31360. *Sir Henry Lawrence*: Are the wheat eaters distinctly more vigorous and more intellectual than the rice-eating population?—If you take the whole Chhattisgarh Division, which is mainly a rice eating tract, the physique is bad undoubtedly; but, for the ordinary district of the Central Provinces where the food is mixed, I should not like

to offer an opinion. But I should say definitely that as far as I know, taking Chhattisgarh, which is a rice-eating tract, the physique is very bad.

31361. You cannot say whether the *juari* eaters of Berar are less advanced in physique and intellect than the wheat eaters of your Division?—I should not say they are on the whole. There is very little difference one way or the other.

31362. *Mr. Calvert*: It has been suggested to me that we are beginning at the wrong end of the stick altogether. You have told Sir Thomas Middleton that putting it succinctly, the object of agricultural improvement was to give the cultivator more money; but it is suggested that he does not know how to spend even the money that he already has?—I am not quite sure that I follow what you mean.

31363. He wastes what he gets?—If you give him more money, in time you can get him to spend it properly; other things being equal, if he has more money he will spend it better.

31364. The evidence shows that there is a marked tendency in this Province for small cultivators to employ more labour on their fields?—I do not know.

31365. High prices simply mean less hours and through high profits of cultivation they employ labour and stop working themselves?—I think that probably may be true in the cotton tracts.

31366. Then the other suggestion put forward is that, however fast we may improve agriculture, the population will merely increase and wipe out the benefit?—You have got somehow to raise the standard of comfort and it is a very difficult problem; but it is a problem, I take it, which is not confined to this country.

31367. Do you think there is any hope at all of improving the lot of the villagers without first altering their outlook on the education of women?—A great deal can be done without it.

31368. You think you can push on agriculture and education and still leave the women in a degraded position?—You could do a lot more than you have done now in that direction, but I should think female education would help a great deal in the long run.

31369. In this Province are the Deputy Commissioners too overworked to take much interest in agriculture?—No; on the whole not.

31370. They have time to encourage the cultivator?—Yes, except perhaps in one or two districts.

31371. So that shortage of Government staff is not an obstacle to progress?—Shortage of what staff?

31372. Of staff to relieve the Deputy Commissioner of his routine duties?—I should say not, on the whole; the average Deputy Commissioner could do a good deal, I think.

31373. We have been told that the B.Sc's. in Agriculture do not like to put their hands to manual labour and a novel suggestion was put forward that in the Agricultural College we should dismiss all the menial staff and make the students themselves do the work. What do you think the effect of that would be?—It depends on what you expect them to do. I understand that the Principal of the Agricultural College for many years past has been insisting on every student handling the plough himself and I do not know if you can do very much more than that. If he is accustomed to plough with his own hands, there is no reason why he should not keep it up afterwards.

31374. Another suggestion has been made that Government itself stands in the way of agricultural improvement by not practising what it preaches; it will advocate wells of one type while it constructs wells of another type; inside the jail the wooden plough is used and outside the jails the agricultural student is asked to use iron plough?—I think it is a matter of money again. In jails your principal object is to provide hard labour.

31375. So that the people in the jail under Government control do not cultivate their jail garden regularly by the methods suggested by the Agricultural Department?—It may be so; I could not tell you.

31376. In order to rouse more interest in rural hygiene it has been suggested that the local dispensaries should be placed under the Public Health Department and not under the Inspector-General of Civil Hospitals ?—Do you mean the touring dispensaries?

31377. Under the present system the medical officers in charge of local dispensaries do not take much interest in hygiene and if they are put under the charge of the Public Health Department they will themselves take more interest in the hygiene of their surroundings ?—I suppose they might be pushed in that particular direction a little more. But the Inspector-General of Civil Hospitals could equally well push them in that direction.

31378. But he is not responsible for rural hygiene ? —That is true; but after all he is a sanitary authority of a sort.

31379. Does your system here of having tenants' rents fixed at settlement in any way hinder a tenant from improving the scale of his farming ? As an enterprising man, can he still acquire more and more land ?—Yes ; but he acquires it with the rent fixed on it. The assessment is fixed on the land and it passes with it.

31380. *Sir Ganga Ram :* Have you any crown lands in your Division, that is lands belonging to Government ?—We have a certain amount of land which has been excised from the Government forest which has almost all been distributed now.

31381. There is nothing to spare ?—Nothing worth while.

31382. Have you any spare land at all, never mind whether it is worth while or not ?—We probably have. I cannot give the exact number of acres available. It is almost all included in the areas demarcated as ryotwari villages.

31383. Would you like to encourage the B. Sc's. in Agriculture by giving them some Government land on favourable lease ?—Yes ; I think it would be a good thing if we could give good land, but we have not got much good land.

31384. It need not be good land ?—They would not go in for bad land.

31385. But suppose they did ?—Then I should give them any encouragement I could.

31386. *Sir Henry Lawrence :* You spoke of the difficulty of raising the standard of comfort of the cultivator. Have you any suggestion to make how it can be done ?—I am afraid not, except that is a thing which might be done, I suppose, through some extension of the co-operative movement. That is the only suggestion I have; it is a very vague one and I have not thought much about it at all.

31387. I think you said that the cultivator made every effort he could to improve his cultivation ?—I think if he sees that anything is going to bring him extra money, he does it.

31388. You do not find villages of very poor cultivation side by side with villages of good cultivation ?—I think you do in some cases.

31389. *The Chairman :* On the same quality of land ?—Yes. Probably there are reasons for that; it may sometimes be due to a bad landlord.

31390. *Sir Henry Lawrence :* Is not the cultivator protected against the bad landlord ?—Yes ; but the landlord in some out-of-the-way place has ways of getting at his tenants and annoying them; he restricts their rights. Occasionally, I think that that might be one of the causes.

31391. Have you any reason to suggest that the cultivator is apathetic in the matter of standard of living, and to what do you trace it ?—I do not know, except perhaps the lack of education to some extent. His chief characteristic is patience and he is content with very little. He seems to be satisfied as a rule with a minimum of clothes and a minimum of food. If you are going to improve agriculture, my idea is to get him a little beyond that.

31392. How can you do that ?—I am afraid I have never found any method. In Berar and in the cotton country, it has come about by his actually getting more money. The standard of living is distinctly higher there and that has come about by the fact that he has more money to spend.

31393. And access by road to more developed areas may awaken his ambition ?—Yes.

31394. Then you come back to the question of road improvement?—Yes.

31395. *The Chairman*: What does the cultivator do with his cash when he sells his rice or cotton in the market on that very day?—I should think he probably takes most of it home.

31396. Does he not very often buy jewellery afterwards from the goldsmith in the market?—I do not think he would, except from a surplus. I think that he would buy his jewellery at leisure and not immediately after he has sold his rice.

31397. *Sir Henry Lawrence*: Have you seen the Raipur rice market where the cultivator goes straightaway and converts his cash into silver?—I have not seen it done.

31398. *The Chairman*: I want to know whether you think it would be a good thing to have a representative of the savings bank in the market, provided perhaps with a small office, who could be responsible for a certain amount of propaganda and advertisement and also for taking deposits then and there?—It might be tried, I think. It would be very difficult to draw the cultivator, considering that the more enlightened inhabitants of this Province are very chary of putting their money into banks. I think the cultivator would be very hard to move in that direction.

31399. Meantime, is the post office doing anything at all to popularise savings?—I do not know.

31400. Have you yourself ever seen any propaganda carried out by the Postal Department?—No.

(The witness withdrew.)

Mr. R. H. BECKETT, Officiating Director of Public Instruction, Central Provinces.

Replies to the Questionnaire.

Question 2.—Agricutural education. Specialised agricultural education is under the direction of the Department of Agriculture. I propose therefore only to deal with this question in so far as it may be said to affect the instruction given in ordinary schools. As my remarks are of a general nature, I do not propose to make them in the form of answers to the specific questions asked.

The introduction of agriculture into the curriculum of ordinary schools is one aspect, of a general question. To what extent can vocational training be undertaken in schools designed to meet the educational needs of all pupils? That such training should be included is frequently advocated on the ground that the present system of education is too literary and calculated to limit the field of employment of those who have undergone it. In this connection, it is important to realise exactly what should be the purpose of an ordinary school. The function of the ordinary school is to provide a liberal education suited to the age and mental capacity of the pupil which will afford him the highest opportunity for developing as a man and a citizen. The curriculum should not be too literary, but should include subjects involving observation and manipulative skill so as to promote a general and not too specialised development. If a purely vocational subject can serve this general educational purpose, there is no objection to its inclusion. On the contrary, if the livelihood of a large majority of the pupils is likely to be connected with that subject, there is much theoretically to be said in its favour. But in practice the extent to which vocational subjects can be introduced into the curriculum of ordinary schools is strictly limited. Vocational training, to be of any real utilitarian value, must be given by experts in specialised courses of instruction which include a large amount of practical work and which cover a number of years, dependent on the type of training to be given. On the other hand, all forms of vocational training demand a certain standard of general education as a foundation on which the knowledge imparted by specialised courses of instruction can be built, the standard of general education required depending on the nature of the vocational course. The ordinary school curriculum has to cater for all classes of boys and certain subjects must be included as an essential groundwork for further education. Little time remains for what may be described as subjects of a vocational character, if the time-table is not to be overburdened.

Thus in primary schools the syllabus must include the 3 R's and a little simple geography. In addition to these, in this Province, gardening, handwork or drawing are taken as an optional subject where teachers are available who can teach them. Nothing more is possible. Here I should like to lay stress on the fact that by far the most pressing need of the Province, even from the point of view of those who wish to increase the agricultural efficiency of the people, is the removal of illiteracy and, where bare literacy has been attained, the improvement of the standard. Until this is done, any general advance, including advance in agriculture, is bound to be slow and handicapped. The removal of illiteracy must be the chief aim of the primary school and the effect of this removal, even on agriculture, will be incomparably greater than could be attained by attempting to teach agriculture in primary schools to an extent which would involve the partial exclusion of the essential subjects. Most of the schools have their little garden plots and, where the teachers are keen, something can be effected, but, speaking in general terms, the main aim must be to see that the pupil receives an education which removes illiteracy, which enables him to take an intelligent interest in his surroundings and in which the courses of study are suited, as far as possible, to the probable needs of the pupil in later life. The whole course of study for primary schools has been drawn up with these objects in view.

In rural middle schools, elementary science (nature study) is taken in addition to ordinary subjects. In these schools I think it possible that something more may be done by the provision of school plots of about one to one and a half-acres, according to the size of the school, where conditions are favourable, and the introduction of a more definitely agricultural syllabus in place of the elementary science syllabus at present in force. The difficulty, however, will be to secure the services of suitable teachers. I should regard the instruction given in these classes as not being vocational in character, but rather pre-vocational, the main object being to interest pupils in

agricultural operations and thus implant in them the desire to return to the land and pave the way for future propaganda by the Agricultural Department. Indeed, such plots might be used by the Agricultural Department for demonstrating the benefits derived from improved qualities of seed, improved methods of manuring, etc. Experiments should, I think, be made in this direction.

With regard to high schools, these are situated in the towns, and I do not think that any agricultural education can or should be attempted. The conditions are not favourable and the majority of pupils have no intention of returning to agriculture. Moreover, a general science course is what is needed by those who wish to take up the study of scientific agriculture. I am most strongly opposed to text-book agriculture which is divorced from practical instruction. At one time a simple text-book in agriculture was studied as a subject for the Matriculation examination. It was merely taken as an easy option and its value both from the educational and utilitarian points of view was *nil*. The course was very rightly abolished. These remarks apply to general agriculture. A course has recently been drawn up by the Board of High School Education in agricultural botany, but up to the present time no school has attempted to introduce this subject.

QUESTION 23.—GENERAL EDUCATION.—(*a*) (*i*) It is a difficult matter to trace the bearing of general education upon the agricultural efficiency of the people. It is my opinion, however, that it has, at the present time, and is destined in the future to have, a more far reaching effect than is commonly supposed. High school or collegiate education is said to have the effect of making those who have received it out of sympathy with rural life. That there is a large element of truth in this cannot be denied, but it is, I think, only partially true, and perhaps not more true in India than in other countries. When the son of poor parents succeeds in obtaining a high school or collegiate education, he naturally finds that the village offers no opportunities for employment. This he has to seek in the larger towns where there is greater demand for his services in whatever profession he takes up. He also finds village life dull and uninteresting in comparison with life in the larger towns. When the sons of a landlord are educated, some of them take up other professions, but some return to the land and it cannot be doubted that the general education which they have received has the effect of widening their outlook, it enables them to take a more intelligent interest in agriculture, and renders them more capable managers of their farms or estates. I have met landlords who take a keen interest in the experiments or demonstrations carried out by the Agricultural Department and the fact that they have received a general education enables them to keep abreast of the times and renders them more efficient agriculturists.

(*ii*) and (*iii*) It is still more difficult to trace the influence of middle and primary schools on agricultural efficiency. But in a general way it may be said that the education which they give renders the pupils more intelligent and paves the way for propaganda work by the Agricultural Department.

(*b*) (*i*) Most rural schools have garden plots attached to them but these are frequently too small and, as already stated, I think that something more may be done by the extensive introduction of school plots of from 1—1½ acres in extent in rural middle schools. It is easy enough to put down a paper scheme but difficult to devise one which really attains the object aimed at. Much will depend on the ability and enthusiasm of the teacher and on the feeling in the village. This matter is engaging the attention of the Education Department and in this connection I attach a note drawn up by Mr. D'Silva, one of the Inspectors of Schools to whom it was referred for opinion. The primary school course of four years under existing conditions can scarcely establish literacy and the absence of suitable and interesting reading matter in villages tends towards a rapid lapse from even the low standard of literacy acquired. Libraries in villages run in connection with the village schools have so far not caught on in the Central Provinces. In fact, it is the apathy of the people towards improvement and culture which forms the chief stumbling block to progress. A live organisation doing propaganda work illustrated by popular lectures, lantern slides, cinema shows, might do much. It would, however, be expensive.

(*ii*) Compulsory education in rural areas is still in the experimental stage in this Province. Up to date it has been introduced altogether in 65 villages. In some cases, as far as can be judged at this early stage, the results are distinctly promising and the anticipated increase in the number of pupils attending schools has been fully realised. In others the term "compulsion" is almost misleading, the attendance authorities having found it difficult to enforce attendance against the wishes of the

parents. On the whole, I think that it is a fair statement of the case to say that as far present experience goes, the results are encouraging.

(*iii*) The explanation of the small proportion of boys in rural primary schools who pass the fourth class is that the children's parents do not yet appreciate the value of the education received and take their boys away from school as soon as they are able to add to the family income by earning a few annas a day in the field. Generally speaking, it may be said that in agricultural areas the regularity of attendance of children at schools is governed by whether or not they are wanted for work in the fields.

Extract from a Note by Mr. D'Silva, Offg. Inspector of Schools.

Suggestions for introducing Agriculture in Vernacular Middle Schools.

1. *Aim of the Course.*—The aim of the course should be definitely to:—

   (*a*) Impart a certain amount of practical information in agriculture useful for even the smallest landowner.

   (*b*) Help in stimulating a new interest in the land and a new outlook on agricultural enterprise.

   (*c*) Develop, to the extent possible, powers of observation and deduction and create habits of experimenting and perseverance.

This is by no means an ambitious aim. It is practically the same as that of the present science course in middle schools. It includes both the cultural and useful aspects of the subject.

It will supply a long felt want and remove completely from the curriculum of our vernacular middle schools that long standing stigma of having courses which do not take into consideration rural life and its requirements. It will secure for our system of education more popularity and win more confidence in our methods and aims.

This suggestion implies that the course must not only be definite but that the aim should be more pointed without being too ambitious.

Boys, teachers and parents are more likely to fall in with a more definite and practical aim than with the idea of indulging in a mere "species of recreation".

2. *Means of attaining the aim.*—(i) The course should receive a definite place in the curriculum prescribed for vernacular middle schools. It may be placed either (*a*) as an alternative to science, or (*b*) be substituted for the present course in science or (*c*) the science course may be so modified as to include the course in agriculture and be called "science and agriculture".

Alternative (*b*) is in my opinion most suitable for vernacular middle schools. The scanty provision hitherto made by local bodies for supplying the prescribed apparatus for teaching science, the poor knowledge of vernacular school teachers and the general environment and conditions that prevail in vernacular middle schools render the teaching of science so ineffective as to be of very little value to the pupils. Agriculture will make a better and more popular substitute and one which the local bodies will be more ready to finance liberally.

(ii) The teacher for this subject should be a regular member of the staff. He may or may not be qualified to teach other subjects, but it is essential that he be a whole time man on the staff, capable of influencing boys. This will gain for him respect from the boys, attention from the management, sympathy from the other members of the staff including encouragement and co-operation from the head master.

There are in almost every District Council service and perhaps in some Municipal services also, teachers trained in agriculture. Some of the younger men of this class could be sent for a special retraining in the subject. District Councils would, I think, readily participate in any scheme of training devised by the Agricultural Department, and would very likely be even prepared to help financially in such training by granting salaries or stipends for the period of training.

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Some of the "third year" trained men could also be selected for a course in agriculture. The supply of teachers will, in my opinion, offer very little difficulty.

If a *kamdar* is considered to be more suitable for the purpose, I would suggest that *kamdars* be specially selected for the purpose and attached to the staff of the school.

In my opinion, the services of a *kamdar* will hardly do if the subject is to be even treated a little more seriously without making it definitely vocational.

If teachers are considered unsuitable, the Agricultural Department may be asked to select suitable men for the post.

The essential qualifications that I would lay down are ability to teach the subject as well as ability to influence boys. The essential condition would be regular membership of the staff.

(iii) Land for carrying out the practical work should be acquired by Government for the purpose and lent to the local body, rent and tax free, solely for the purpose of such work and it should be definitely stated that the rights of the local body cease to exist if the land is not regularly used for the special purpose for which it is given.

The acquisition of land may be sometimes an expensive undertaking but there will also be instances where land may be given as a gift or part-time gift by some malguzar on the same conditions that Government would give to the local body. Such instances would, I think, keep the total expenditure on acquisition within manageable proportions.

If acquisition is too expensive an undertaking, Government might help in the acquisition and pay for the costs and other initial expenditure on the same basis as a special grant for building or furniture and apparatus, the local body paying its due share on the same basis.

The cost of upkeep and any other recurring expenditure would of course be borne by the local body and included in the expenditure for Government grant.

(iv) The time that was devoted to the subject at Chaurai was about one hour per day, *i.e.*, about five hours per week. This was considered essential for the course at Chaurai. The time at present devoted to the teaching of science is in most cases three to four hours per week.

The course now proposed is only a bit reduced in quantity compared to the course that was in force at Chaurai. If the subject is to replace or be an alternative to science, there should be no difficulty in the boys devoting four or five hours per week to the subject. This may be done by having two periods of two hours' duration and one period of the normal duration of 40 to 50 minutes for notes, recording of observations, questions from boys, etc.

3. *Conditions helpful for realising the aim.*—(i) Confidence of the parents in the practical value of the course. They will see this value better in the school plot than the demonstration plot.

(ii) Interest and good-will of the boys. This will be secured more easily when connected with the school work rather than work under a *kamdar* at the demonstration plot.

(iii) Insisting on primary schools in the neighbourhood of vernacular middle schools carrying out the gardening programme laid down for them.

(iv) The produce should be given to the boys and parents should be invited frequently to see the school plot.

(v) Co-operation between the staff and agricultural teacher.

(vi) Regular supervision from the Agricultural Department and co-operation between the local body and the two departments concerned.

(vii) Last but not least—The courses should only be commenced after land has been acquired and teachers trained.

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4. Centres where the scheme suggested may be tried, irrespective of the existence of demonstration plots and where the scheme is likely to succeed :—

(i) Hoshangabad district—All the eight vernacular middle schools would welcome the scheme and the District Councils are likely to be keen on it. The following centres will be well worth a trial :—

(a) Babai in the Hoshangabad tahsil.
(b) Sobhapur in the Sohagpur tahsil.
(c) Timarni in the Seoni-Malwa tahsil.
(d) Handia in the Harda tahsil.

(ii) Nimar district—

(a) Harsud in the Harsud tahsil.
(b) Shahpur in the Burhanpur tahsil.
(c) Bhamgarh in the Khandwa tahsil

(iii) Betul—

(a) Betul Bazar in the Betul tahsil.
(b) Bhainsdehi in the Bhainsdehi tahsil.
(c) Multai in the Multai tahsil.

(iv) Narsinghpur district—

(a) Kareli in the Narsinghpur tahsil.
(b) Tendukheda in the Gadarwara tahsil.

(v) Saugor district—

(a) Rehli in the Rehli tahsil.
(b) Banda in the Banda tahsil.
(c) Gadakota in the Rehli tahsil.

(vi) Damoh district—

(a) Hindoria in the Damoh tahsil.
(b) Patharia in the Damoh tahsil.
(c) Hatta in the Hatta tahsil.

(vii) Chhindwara district—

(a) Amarwara in the Amarwara tahsil.
(b) Chaurai in the Chhindwara tahsil.
(c) Mokhair in the Sausar tahsil.

Oral Evidence.

31401. *The Chairman* : Mr. Beckett, you are officiating Director of Public Instruction in the Central Provinces ?—Yes.

31402. We have your notes of evidence. Do you wish to add anything at this stage to your written note ?—No.

31403. Have you any views on adult education that you would like to put before the Commission ?—It depends on what you mean by adult education.

31404. I am thinking primarily of adult education designed to equip adults with literacy ?—In regard to adult education in this Province I think that the education of adults is of comparatively minor importance as compared with the education of the child. There is very little demand for adult education and the experiments which have been made in regard to it show that the expenditure incurred on it is to a very great extent wasted.

31405. What experiments are you referring to ?—Certain local bodies have opened schools for adults and the general experience has been that after a short time the attendance falls, so that the class is scarcely worth continuing. The year before last an experiment was made in this direction by the Training College at Jubbulpore and a class of about 36 adults was got together and instructed by the Training College staff. At the end of two or three months this class of 36 had dwindled to three or four. A certain amount of success has been met with in connection with welfare work in the mills, but the success attained has really only been moderate. What I think it amounts to is this, that where an adult can see that he is going to gain some material benefit from education you may get that adult to attend a literacy course. But unless he can see some material advantage he will not attend throughout the course. He is too tired at the end of the day's

work to attend regularly. Generally speaking, the time which he has given to the course and the money expended on it are wasted. That is why I feel that the main line of attack against illiteracy must be through the child.

31406. Do you think that there is a lapsing into illiteracy on the part of the children who have, at one stage or another of their lives, attended school?—I am afraid that there must be a good deal of it; I have not got actual statistics with me. I have seen estimates given, but I do not know how these estimates have been arrived at.

31407. Have you yourself formed any view in the matter?—I think that undoubtedly, especially in rural areas, there must be considerable lapsing into illiteracy.

31408. Do you think that is due in part to the fact that the majority of the children return to parents who are entirely illiterate?—It must be largely due to that.

31409. In that connection, do you associate the need for adult education with the problem of achieving literacy amongst children?—The trouble is that I do not think it can be managed, for the simple reason that you cannot get adults to attend schools. I think that wherever there is a demand for adult education, it should be encouraged and met and that if possible the demand should be created. I think, however, that adult education should always be a side line, as compared with the main line of attack which after all is the line which has succeeded in all other countries.

31410. Have you any views as to the possibility of developing female education in this Province?—We have formed a committee at present to go into the whole question of girls' education. The difficulties in the way of advance are great. Secondary female education is progressing because the intelligentsia are recognising more and more the desirability of educating the feminine half of the population. But as regards female primary education progress has been extremely slow. There are various reasons for this: the apathy of parents is perhaps the chief reason.

31411. Is your department carrying out any propaganda in favour of education?—This committee which we have formed may be regarded as doing propaganda work. It will consult public opinion. In addition, the officers of the department are always impressing upon the people, whenever possible, the necessity for girls' education.

31412. Are you using other departments to help you? How about the Co-operative Department? Have you attempted to use that department?—I do not think that we have made great use of the Co-operative Department.

31413. Do you think you might do so?—Yes.

31414. Co-operation itself is primarily an educative movement, is it not?—Yes.

31415. You describe the system in vogue in primary schools. Do you attach much value to the nature study being taught at the present moment in your primary schools?—I attach some value. In practice we find that it is extremely difficult to get satisfactory nature study teachers.

31416. Is that because you draw your teachers from the wrong class? Or because you do not pay them enough? Or because you do not instruct them enough in the methods of teaching nature study?—I do not think any of these causes hold good. Our rural school teachers are villagers; they are trained to teach in our normal schools which are quite good normal schools and the pay is not unsatisfactory. The minimum salaries prescribed by Government are: for our untrained teachers, Rs. 15; trained teachers Rs. 20. In dear districts the untrained teachers get Rs. 18 and the trained teachers Rs. 23. In many districts the pay of the head master goes up to Rs. 50, Rs. 55, Rs. 60.

31417. What proportion of the teachers are trained and what proportion are untrained?—I could not give you the exact figures: the greater number of them are trained.

31418. *Sir Ganga Ram*: And the greater number of them are graduates?—I am talking of primary school teachers who are not graduates.

31419. *Prof. Gangulee*: How many normal schools have you?—We have 11 normal schools and they are capable of turning out more masters than we at present can find employment for. In fact we had to reduce one or two sections because the market was getting unduly congested. This was due to the fact that local bodies

in certain cases confirmed untrained teachers, but we have pressed on them the undesirability of confirming more untrained teachers. Our normal schools meet the demand for the supply of trained teachers and we can turn out more teachers than we can find employment for at the present moment.

31420. *The Chairman* : I think the only middle school with a vocational course in agriculture is on the budget of the Agriculture Department ?—Yes, the Powerkhera School at Hoshangabad.

31421. Are you familiar with the working of that school ?—Only on paper.

31422. Are you, as a department, contemplating any experiment of that sort, or is it your intention to leave the future development of that in the hands of the Agricultural Department ?—Not the agricultural training given in ordinary schools, which I regard as prevocational training. As I have stated in my note, I think that vocational training, if it is to be of any use, must be given in specialised institutions where students are taught by specialists, and the course must cover a number of years. But we are contemplating introducing agriculture into our rural middle schools. I enclosed a note* which was sent in by one of the Inspectors of Schools, which is generally on sound lines, and I think it is perhaps likely that we shall experiment in that direction in the near future.

31423. When do you expect this experiment to be made ?—I think that the department will be taking it up shortly, on the lines set forth in my note. We shall have to acquire land.

31424. Meantime, you have nothing of that sort in operation ?—No.

31425.—Have you any views about compulsion in primary education ? Do you think that is a principle that should be applicable in this Province ?—I am strongly of opinion that it is through compulsion and through compulsion alone that we shall be able to combat illiteracy. Compulsory schemes have been introduced, as I have stated in my note, in 65 villages. It has also been introduced in certain Municipalities, and it seems to be spreading. For example, I passed a scheme for compulsory education in Raipur a few days ago, and a scheme for its introduction in 21 villages in Bilaspur is under consideration; a scheme for the Balaghat Municipality is ready for sanction. I mention these as instances which show that it does seem to be taking hold.

31426. What is the longest period for which compulsion has been enforced for any particular district ?—I think three years.

31427. Do you expect the principle of compulsion to diminish, by an important extent, the leakage between the bottom and the top of the primary system ?—I do; I think it is the one way of diminishing that leakage which is likely to be absolutely effective.

31428. Do you expect a complete stopping of that leakage by means of compulsion? Or do you still expect to lose a proportion ?—I think in the beginning a proportion may be lost, because in certain cases local bodies may be rather reluctant to enforce the rules, but I think that things will be tightened up in course of time, and I do not see why the whole leakage should not be stopped altogether.

31429 What penalty is visited on parents who disobey the laws and the rules ?—At present a fine is inflicted.

31430. Who benefits by that fine ?—Presumably the local authority, but I have forgotten.

31431. Have you any indication as to the number of fines that have been levied ?—No, I have no information.

31432. Do you think that local authorities are taking action of a disciplinary nature ?—They vary. In some cases, the numbers who have attended have gone up satisfactorily, and it would seem, if the first estimates were correct, that practically every boy has been brought in to the school, but it is too early yet to say whether there has been leakage during the operation of the course.

31433. Do you form the view that there is an increasing demand for education for their children amongst the cultivating classes ?—There is certainly an increasing demand in some districts. In other districts, I am afraid that the parents are to a large extent apathetic. I think there is certainly an increasing demand in the urban areas.

**Vide* pages 370—372.

31434. Where such a demand exists in a purely rural area, have you been able to associate that demand with any other circumstance or condition ?—I should think, speaking broadly, that one might associate it with the general welfare of the people.

31435. You mean general prosperity ?—Yes.

31436. The well-to-do are the first to ask for it ?—Yes.

31437. Meantime, the Commission has been told that primary education is entirely free : is that so ?—Compulsory primary education is entirely free.

31438. What about optional primary education ?—For optional primary education, I think a very small fee of one anna or somethihg like that is levied.

31439. One anna a month ?—Yes.

31440. Is that the general position throughout the Province ?—Yes, I think that is the case.

31441. How about books ? Does that include books ?—Most District Councils give grants to poor boys ; otherwise, the pupil supplies his own books.

31442. So that, except where the boy is regarded as a poor boy, the expenses to the parents amount to one anna a month *plus* the expenditure for books ?—Yes ; it is one anna a month *plus* the expenditure for books, which is quite small.

31443. Are you the permanent Head of the department ?—I am the officiating Head.

31444. Your Chief being away ?—Yes ; he is on special duty with the Government of India.

31445. How long have you been in charge ?—It is now about three months, and I have officiated before for about 14 months.

31446. Is the appointment which has taken your Chief away from the Province likely to be one of long duration ?—It is a temporary appointment.

31447. *The Raja of Parlakimedi* : During your experience in the department, did you find the tendency to learn growing in the rural tracts ?—As I have just stated, I think it is growing in the more prosperous tracts, but in the less prosperous tracts the parents are, to a large extent, apathetic, and they have to be persuaded to send their children to school in many cases.

31448. What is the class which usually takes advantage of the schools ? Are there any particular classes which do so ?—The more well-to-do classes do so. Of course, certain castes take to education much more readily than others.

31449. How are the primary and middle schools financed ? Are they financed by Local Boards, or do they get any grants from Government ?—Vernacular primary and vernacular middle schools are financed both by local bodies and by Government funds.

31450. Are those schools growing in number ?—Yes.

31451. When giving Government grants to such schools, what are the factors you take into consideration ?—We have different systems. In our grants to Municipalities for vernacular education we have a certain formula according to which the grant given by Government is based on the expenditure of the Municipality on education. We take the expenditure on vernacular education, deduct from it 6¼ per cent of the Municipality's income, and give a minimum grant of half of the difference. In the case of local bodies, Government gives from time to time, when funds are available, large lump sum receiving grants which are devoted to various objects, say, for improving the pay of teachers or for instituting provident funds, or for expenditure on expansion as the necessities of the moment may require. In addition to that, we occasionally give a special non-recurring grant for the erection of school buildings. For example, last year we gave Rs. 9 lakhs to local bodies for the erection of primary school buildings. Of course, to these recurring grants from Government, local bodies add their own funds.

31452. As regards the construction of buildings, is it not the practice that local bodies should find half of the expenditure ?—We have no general rule. For instance, this grant of Rs. 9 lakhs was given without any conditions of that sort. In some cases local bodies who could afford to do so spent more than the money allotted ; in other cases, they are spending what was allotted.

31453. As regards the introduction of agricultural study in middle schools through the vernacular, are there sufficient books available on the subjects, so that it may be taken up at once?—I do not know whether there is a book which would suit the course which may be introduced. I do not think that that matters very much because there are plenty of books which can be used for the instruction of the teacher, and the teacher would work to a syllabus rather than to a text-book.

31454. How long would it take to get these schools to take up agriculture?—In the first instance, we should introduce it as an experimental measure in a few schools so as to find out the best line of attack. Then it would depend on the funds available.

31455. *Sir James MacKenna*: I understand that, in addition to being Director of Public Instruction, you are also Secretary to Government in the Education Department?—Yes.

31456. What are the advantages of that arrangement?—I think that the work goes through more smoothly and easily.

31457. You deal direct with the Minister?—Yes.

31458. And he issues his final orders as the orders of Government?—Yes.

31459. How long has that scheme been in force?—I could not say with certainty; I think about five or six years.

31460. It is of some standing?—Yes.

31461. Would you be able to express an opinion whether such an arrangement would work in the case of the Director of Agriculture?—I would rather not express an opinion on that.

31462. You are a science man yourself?—Yes.

31463. Are there any arrangements for the teaching of botany in the high schools?—No arrangements have yet been made for the teaching of botany. The High School Board has drawn up a syllabus in agricultural botany for the use of high schools, but so far no high school has applied for recognition in that subject.

31464. Students entering the Agricultural College would have to take a course in general botany before going in for economic botany?—Yes.

31465. What sciences do you teach in high schools?—Chemistry and physics.

31466. Up to a high standard?—Up to the usual Matriculation standard. It is a preparatory course.

31467. Would that standard be sufficient to enable them to superimpose a course in applied chemistry without further general chemistry?—No, they would need further training in general before taking up applied chemistry.

31468. *Prof. Gangulee*: Is it the definite policy of the Government to introduce free compulsory education?—Yes, by degrees.

31469. The policy has been outlined, and that is the intention?—Yes.

31470. There are 65 villages where compulsory education has already been introduced?—Yes.

31471. Is that by local bodies?—Yes, assisted by a Government grant.

31472. What is the extent of that grant?—Half of the additional expenditure b oth recurring and non-recurring) entailed.

31473. Is the curriculum for the compulsory primary schools the same as for the optional primary schools?—Yes.

31474. Is there any change in the quality of the teachers?—No. When we fix the grant for teachers' salaries, we usually take into consideration the cadre as a whole and fix scales of pay at rather liberal rates in order to provide a reasonable flow of promotion for the whole cadre.

31475. What were the rates of pay you mentioned in answer to the Chairman?—Those were minimum rates. The pay varies a little according to the district, from Rs. 20 to Rs. 23, for trained teachers, rising to Rs. 50 for the post of Head Master in most districts.

31476. What is the average attendance at these schools?—I cannot tell you off-hand.

31477. Are they one-teacher schools ?—No ; we aim at getting fairly large schools, with 4 or more teachers.

31478. Who has the management of these compulsory schools ?—They are managed by the local bodies.

31479. Is there any supervision by your department ?—The department fixes the curricula and standards ; the examinations are conducted by the department.

31480. Who does the inspection ?—It is carried out by the Deputy Inspectors who are usually Government servants ; but as an experimental measure they have been transferred in 4 districts to the local bodies.

31481. Who pays them in that case ?—Their salaries are paid by Government as before.

31482. Is there any provident fund for primary school teachers ?—Yes, either a pension or a provident fund has been introduced, and practically all trained teachers are entitled to benefit. I referred a moment ago to certain lump sum grants made by Government. The object of one of those grants was to found pensions for teachers. Speaking from memory, I think Government gave the whole of the money for founding this pension scheme, which in some cases is now being converted into a provident fund scheme.

31483. In the compulsory schools are all the teachers trained ?—Most of them.

31484. Are they trained in normal schools ?—Yes.

31485. You have one Training College, I understand ?—Yes, but that is for the training of Anglo-vernacular schoolmasters. There is a Normal School attached to it.

31486. Who are the teachers in the Normal Schools ?—Most of them are graduates who have been trained in the Training College ; some are under-graduates. There are certain upper and certain lower division posts. The Head Masters are specially selected men on Rs. 250—300 a month. In addition, certain Superintendents of Normal Schools are in the Provincial Education Service, and can rise to Rs. 800. On the whole, the schools are very well staffed.

31487. Do they get any agricultural training of any sort ?—The students get a general science training, which includes nature study, and for giving that training we have masters who have taken an agricultural degree in most cases, or at any rate taken a special course in agriculture.

31488. What about the pupils ? Do you take them to see Government farms in the neighbourhood ?—That depends on the situation of the Normal School. The one in Nagpur happens to be near a Government farm, and I think they make use of it ; but there are others which are not near a farm and cannot. They have their own plots of land.

31489. There is a plot of land attached to the Normal School ?—Yes.

31490. Do they farm on it ?—They grow vegetables and so on in an experimental manner, and crops to some extent.

31491. The teachers are supposed to go to rural areas and teach there. I would like to know whether they are adequately trained in the problems of rural life or not ?—Most of the teachers in rural schools are villagers themselves ; they go to the Normal School from the village. They have spent their lives in rural surroundings. Moreover, most of the Normal Schools are in semi-rural surroundings ; the fields are close by.

31492. You have referred to the efforts you want to make in collaboration with the co-operative movement. Have you formed a definite plan of campaign in that connection ?—I think the system prevailing in the Punjab, where they have a Board consisting of the Directors of Public Instruction, Co-operative Credit, Public Health and Agriculture, might be useful in this Province for propaganda amongst adults, which is a form of adult education to which I attach considerable importance

31493. What are the composition and functions of your High School Education Board ?—The composition is varied. Certain members are chosen for their educational qualifications ; these form the majority ; 3 members represent the Legislative Council, 7 the University ; there are 5—7 selected Head Masters, and there are also representatives of agriculture and engineering.

31494. What is the state of your vernacular middle schools? Is the number increasing?—Yes, particularly in Berar, probably because English has been added as an optional subject in a large number of the schools in Berar, and English is, of course, very popular.

31495. Are these schools controlled by the High School Education Board?—No; most vernacular schools are under the management of local bodies, but the Board, fixes the syllabus both for middle and high schools You asked me the powers of the High School Board. It controls the curriculum and examinations and has the power of recognition.

31496. You spoke of the failure of night schools. How do you account for the fact that when such schools are organised by missionaries or by the Young Men's Christian Association they are generally successful? Will you tell me where they have been successful?—In big towns a number of adults may be led to see that education will materially advance their interests, and that will make such schools a success; but the villager cannot see what he is going to gain, and is usually tired out at the end of the day's work.

31497. Even in rural areas, Missionary and Young Men's Christian Association night schools have generally succeeded, whereas efforts made by Government and other agencies have failed. That was the case in certain villages we visited near Coimbatore, for instance?—One cannot say why certain schools have succeeded and others failed without knowing the local conditions. It is quite possible the missionaries have at their disposal men who are prepared to take up the work in a missionary spirit, either on very low pay or with no pay at all, and who, by reason of their personality, are able to exert more influence than the ordinary village school master.

31498. It is perhaps a question of personality?—Very largely.

31499. Have you carried out a survey of areas where primary schools might be established?—Yes, a survey has been made, I think in 1923. It was carried out in connection with the introduction of primary education. The method of advance in the past has been to a large extent to work through local bodies and District Officers who have a good idea of where schools may be set up with advantage.

31500. Care is taken not to establish half a dozen schools in one area while leaving another area without any?—Local bodies know very well where schools are needed most. What you suggest may occasionally occur where there is a large number of communal schools, but that does not apply to any extent in the Central Provinces. It may happen that a village has an Urdu primary school as a separate institution, but we have not come to the stage that has been reached in some other parts of India where there are several communal schools in one town.

31501. Has any one been sent to the Punjab to study their method of introducing agricultural training in middle vernacular schools?—No.

31502. Nor to Moga?—Nor to Moga.

31503. What about the depressed classes? Are they still hostile to education?—I do not know that 'hostile' is the correct word to use. A certain number of the depressed classes are beginning to realise the necessity for education. But speaking of the bulk they are, I am afraid, apathetic. We do everything we can to encourage them We give special grants, but the results are disappointing. In the case of the depressed classes there is a deplorable falling off between the first and the top standard of the primary school.

31504. But the efforts made by the Labour Department in Madras, as you know, have proved very successful and these depressed classes themselves are putting up school houses?—I regard, as I said before, compulsory primary education as being the most effective means of educating the depressed classes. I do not think that anything will work as well, in practice, as compulsory education.

31505. *Mr. Calvert*: It has been given in evidence before us that compulsory education has not made any headway in this Province. Do you agree with that?—I think that the headway has been small up to the present, but it is now going on at an increased rate and I am becoming optimistic as to the rate of progress in the future. I think it is going to act as a sort of snowball.

31506. One witness says the main cause of the unsatisfactory figures is the apathy of the attendance committee?—That may possibly be true in some cases. I

think conditions vary from district to district but certain attendance committees are very keen on their work and they are seeing that the children attend school Of course it is too early yet to pronounce a final opinion.

31507. The system of compulsory education has not been in force long enough to have any influence on the attendance in the upper classes, say the fourth class ?—Not yet.

31508. That will be the real test ?—Yes.

31509. *Sir Henry Lawrence*: But the boys who are already in the fourth class are now compelled to attend, are they not ?—Yes; that is true

31510. *Mr. Calvert*: Leakage has taken place before that stage ?—Yes, I think you might possibly find the figures interesting.

31511. I should like to know what is the comparison between the first and fourth classes ?—I do not think that the comparison between the first and fourth class is at all a fair comparison because in the first class there are a considerable number of infants whom it would take two years to pass out of Class I. A fair comparison would be between Class II and Class IV. If you take the second and fourth classes in the Province as a whole the fall in numbers is from about 64,000 to 46,000 or a falling off of about 25 per cent.

31512. The fourth class is the literate stage ?—Yes.

31513. You are reckoning to turn out about 46,000 literates per year ?—Yes.

31514. Have you ever tried to compare that with the normal death rate among literates in the Province to see if you are really making progress ?—I have made no such comparison. It must be remembered that those figures, I mean the figures between the second and the fourth classes are largely the result of the fall in numbers which takes place amongst the depressed classes and the more backward communities. If the higher castes are taken, the fall is from 45,000 to 35,000, that is 10,000 in 45,000; so that I think this fall in numbers is sometimes rather exaggerated. A mistaken idea arises from making a comparsion between the number in the first and the number in the fourth class.

31515. This same witness refers to the decision by the Local Government to invest the Director of Public Instruction with the power to supervise the expenditure of the money earmarked and spent on education. Had you no power before ?—In the case of local bodies, the management of schools under the recent Act is placed in their charge. The grants given by Government have been given for specific purposes and if they are not spent on those purposes we have power to reduce the grants; for example if a grant has been given for pensions contribution and if pensions are not given, we have power to reduce the grant. But apart from that Government exercises very little control. Of course Government can always reduce the local body grants for good and sufficient reasons but it is rarely done.

31516. It has also been given in evidence before us that Indian boys are generally deficient in powers of observation as compared with English boys. Would you agree with that ?—I am not prepared to make a statement of that kind. I think to a large extent it would depend on the teaching which the boy had received. If properly taught, I think that the Indian boy is observant.

31517. The point is important when you are discussing whether your teachers should be from the village or from the actual cultivating class, because we assume that a member of the cultivating class may know something of agriculture, whereas a non-cultivator in a village may be ignorant of what is going on around him ?—A considerable number of our teachers are drawn from the cultivating class and in rural areas it is generally true to say that the teachers are villagers. Frequently, of course, they return to their own villages, which I consider to be very desirable.

31518. You mentioned to the Chairman that attempts to encourage adult education had not given very good results in this Province. Has any persistent propaganda been carried on in favour of adult education ?—No; I can hardly say that there has been any persistent propaganda, but if you have a parent who is not prepared to send his boy to school it is hardly to be expected that he will go to school himself at the end of the day's work unless he expects to get some material benefit from it.

31519. Then we have it on record also that there is work for only 100 days in the year, so that there is ample leisure. Do you think that you have got the right type of teacher for the adult schools ?—We have to make use of the teachers available.

I have no doubt that, if you could put down an enthusiastic graduate, he might by his personal influence obtain an attendance which the ordinary teacher might not be able to obtain ; but it is outside the region of practical politics to do that.

31520. Do you not think that a teacher for adult schools must have special qualities as compared with one for a school for children ?—I should think so.

31521. Did you get any special readers for adults ?—No.

32522. Do you not think that a reader which is suitable for infants is rather unsuitable for adults ?—No I think that it suits them in the early stages. It is designed on a progressive system.

31523. You do not think that an adult, after having painfully laboured through a few sentences, feels disappointed when all that he learns is that "the cow has four legs"?—It is difficult to make interesting books out of words of three letters. That must come later.

31524. Special readers have not been tried ?—No.

31525. *Prof. Gangulee*: You have told the Chairman that the education of the adult is of minor importance ?—Yes, comparatively speaking, as we can get much better results by educating children. Funds are limited. If you have limited funds and spend too much money on the education of adults, it really amounts to taking away the educational bread from the mouths of the children. Adult education is expensive when measured in terms of literacy. We find for example in our Normal Schools that above the age of 25 years, adults are practically unteachable. For that reason they have been excluded from our Normal Schools. They were unfit mentally to profit by the instruction given.

31526. *Mr. Calvert* : You do not think that there is any connection between the teachability of the pupil and the teacher ?—I think that to a certain extent that connection does exist. But take, for example, the experiment which was made a couple of years ago by the Training College staff where the adult class had the benefit of good and experienced teachers. Nevertheless the pupils did not remain and numbers fell away to such an extent that the class was discontinued.

31527. We were given a little pamphlet by Mr. Mande. Was that experiment followed up at all inside the jail ?—No; I think, though, that a considerable extension of the experiment in jails is under consideration.

31528. Does your department regard itself as in any way responsible for the moral uplift of the villagers ?—It is responsible for the education of the villagers and a part of that education consists in moral instruction.

31529. If you took a series of villages with a school and another series without a school, would you find any difference in sanitation, health and general conditions between the two ?—I am afraid I am not prepared to express an opinion on that question.

31530. Is there any attempt here to teach your teachers the economics of village life, that is, land administration, a little agriculture, stock breeding, etc. ?—I do not think that they teach economics in that sense.

31531. You have not schools in which they go through a course in rural economics?—No.

31532. Do you think it would popularise education if they could be of more practical assistance to the villagers ?—I am doubtful whether it would have any effect.

31533. *Sir Henry Lawrence*: The last witness has told us that the teacher is almost always a half educated Brahmin with no interest whatever in, and no knowledge of, agriculture ? Do you agree with that statement ?—I do not agree with that statement at all. Our village schools, as I have said before, are staffed very largely by villagers who have gone through the vernacular middle school course ; this has been followed up by a two or three years' course in our Normal Schools which, I think I may say, are very efficient institutions. In the case of the teachers in secondary schools in the high schools department, they are all graduates who have taken a degree in teaching as a post graduate course, and in the case of the middle schools department they are

undergraduates who have gone through a two-years' course of instruction as teachers, I think that on the whole our teachers are very well trained.

31534. Conditions vary very much in different Provinces. In some Provinces they are largely Brahmins. Here it is not so?—Not in the case of primary school teachers.

31535. Can you give me any percentage at all?—I am afraid I cannot. I might be able to get the figures.

31536. Do you think it is about half and half?—I could not say. I shall try to find out and let you have the figures.

31537. What do you consider is the driving force behind this movement for compulsory education?—I suppose that the public feeling is that the general advancement of the Province is dependent on primary education.

31538. And are the people who ask for this compulsory education the people who would otherwise not have their children educated?—I do not know that the people who would not have their children educated are the people who ask for this education. I think really that the education is thrust upon them by the members of local bodies who realise that compulsory education is in the people's interests.

31539. And do I understand you to say that it has been introduced through Municipal Councils or through the District Councils?—Both. When I said 65 villages those were all under District Councils; in addition it has been introduced in a certain number of Municipalities.

31540. In how many districts are these 65 villages?—I think four districts.

31541. And some twenty districts have not taken any step in that direction?—No; but I think it is going to spread.

31542. If a parent does not send his boy to school, who decides whether he should be prosecuted or not?—An Attendance Authority is formed under the Act and the Attendance Authority is responsible.

31543. That body consists of members of the District Council, does it? What is the constitution of that authority?—I could not say without a reference to the notification.

31544. Is it official or non-official?—Non-official entirely.

31545. Up to date they have instituted no prosecutions?—There have been a few prosecutions; not many.

31546. Do you anticipate any difficulty, if prosecutions are started, that that would lead to any disapproval on the part of the people affected?—I think, possibly in the beginning, perhaps public opinion will have to be educated.

31547. *Sir Ganga Ram:* In the Punjab, in Lyallpur, we have started a Normal School for rural teachers, who go through one year's course in agriculture. Have you got anything of the kind here?—No, but when we have these larger school plots and introduce agriculture as a subject of study in the vernacular middle schools, we shall of course arrange for the training of the teachers by the Agricultural Department.

31548. Have you in your schools any plots allotted for agriculture, as demonstration plots?—We have school gardens, but we have no plots of larger size.

31549. What size are the plots which you have got?—The ordinary school plot varies in size.

31550. Can you give me an idea of the size of the school garden?—It may be the size of this room.

31551. What do they grow in that?—Flowers and sometimes vegetables?

31552. Vegetables for the schoolmaster?—Sometimes.

31553. There is nothing to teach the boys the mode of ploughing or harvesting, or something of that kind?—That is scarcely possible in these plots, but the school garden up to date has not been much of a success. I think it needs a little stiffening up.

31554. In this Province, have you any book giving agricultural mottoes in the vernacular language?—Not that I am aware of.

31555. Would you at least approve of selected agricultural mottoes being introduced in the curriculum of the rural schools?—Yes, it might be a useful thing to do.

31556. So that the boys can learn old men's experience?—Yes.

31557. In the Punjab we have got a book of mottoes which was edited by a Civil Service officer. Is there no recognised book of mottoes in this Province?—I am not aware of such a book.

31558. Do you teach scale drawing in the high school?—Yes, drawing is taken as a subject of study in the high school.

31559. Up to what standard is scale drawing taught?—Geometry, of course, is taught in the high schools up to Matriculation.

31560. Could a student of a high school reduce a map to half its size?—I presume that is part of the drawing syllabus, but without reference I could not say whether that particular point is brought out.

31561. Have you started teaching the boys the use of tools, for instance, those used in carpentry?—Yes, we have manual-training teachers attached to a number of high schools.

31562. Not in all of them?—Not in all so far, but that is coming.

31563. Do you find any difficulty about depressed class boys learning in the same schools with the higher caste boys?—We have had difficulty at times.

31564. But now they have merged? Do they sit together and learn together?—The department insists on their being treated alike in schools. Occasionally, parents object and there is trouble.

31565. What is the result of the trouble? Do you expel them?—No. In some cases, where local opinion has been very strong, they have separate schools.

31566. You have given way to that movement?—The department does not give way, and in all Government institutions we insist on all pupils being treated on the same footing.

31567. Have any boys gone to England with a Government of India scholarship for studying any industries?—Yes, we sent one Home last year, and we are sending another this year for electrical engineering.

31568. On a Government of India scholarship?—There used to be Government of India scholarships, but now they are awarded by the Local Government.

31569. You send one every year?—One has been sent every year, I think, for the last few years.

31570. For three years?—About three years.

31571. Do you think that in three years he will learn anything about electrical engineering?—I hope so.

31572. What is your experience of the men who have come back to India after their studies in England? Have they done any useful work, or have they taken to any industries?—I could not say from memory, but I think the results, on the whole, have been rather disappointing.

31573. Could you give us a list of those who have gone and any report about them?—Yes, such a list is submitted every year to the High Commissioner.

31574. Will you send us a copy of that?—Yes.

31575. I suppose you are a syndic of the University?—Yes, I am a member of the Executive Council, as we call it here.

31576. You mean the Syndicate?—The Executive Council is the governing body and it really takes the place of the old Syndicate.

31577. Generally, how many boys pass the entrance examination, and how many graduates pass in a year?—I am afraid I could not give the figures without a reference.

You may send the figures afterwards.

31578. Is the Province overcrowded with graduates of the University, or do the graduates find employment?—I think they get employment.

31579. Up to this time there is no overcrowding?—There is no great overcrowding, certainly.

31580. What is the scale of pay that a matriculate boy expects?—I think as a clerk he starts on Rs. 35, but I am not sure.

31581. And what start does a graduate get?—Supposing we take a graduate as a schoolmaster, he starts on Rs. 80.

31582. If he is not a schoolmaster, what does he get?—I think that would be a fair figure to take.

31583. When you talk of female education, can you give me any percentage of the literacy among the females?—I could not say what the percentage is, but it is very low.

31584. Do you not work the figure out in your annual reports?—The percentage of literacy is in the census report.

31585. You do not report on it in your annual report?—We do not report on the literacy of the people as a whole.

31586. Literacy among women is a very important matter which every Director of Public Instruction does report on in his annual reports. If you want to expand female education, are you well equipped with teachers?—No. I am afraid the problem of the woman teacher is rather a serious problem. As a matter of fact, our cadre of teachers for Government schools, speaking from memory, is 730 or 740 in girls' primary schools. I understand you are dealing with primary schools. Out of this 730, in Government primary schools for girls, I think about 120 are men. They are usually pensioners, old schoolmasters. This number is being steadily reduced year by year, so that I think, in a few years, all our primary Government girls' schools will be staffed by women teachers. Similarly, aided primary girls' schools, which are usually run by Missionary Societies, are staffed by women teachers, I believe almost exclusively.

31587. Have you any Normal Schools for training these teachers?—We have two Government Normal Schools, and there are two aided Normal Schools for women teachers.

31588. *Sir Thomas Middleton*: How many kinds of primary schools exist in the Province, Government, District Board, Missionary, private?—Schools are managed by local bodies, and in addition there are aided schools. There are only a very few Government primary schools, except girls' schools.

31589. I heard you mention Government primary girls' schools, and I did not know whether you had any Government primary boys' schools?—There are only a very few Government primary boys' schools. Female education is regarded as rather a tender plant, and Government provincialises a school as soon as a certain minimum number attend, and pays the whole of the cost of upkeep.

31590. The boys' schools are the schools of the local authorities, aided schools and mission schools which are private. Is there any private venture school other than the missionary school?—There are a good many unaided, private venture schools.

31591. There is no private school aided by you, except those undertaken by some body like a missionary body?—There are a few other bodies. There are certain societies which have schools aided by Government; for instance, the Depressed Classes Society has schools; those are aided schools.

31592. Do you publish regulations for grants-in-aid?—Yes.

31593. And any school asking for a grant must satisfy you as to certain conditions. Yourself having been satisfied, how is the grant assessed? Do you pay a uniform percentage of the net cost, or do you vary your percentage, depending upon the efficiency and other conditions of the schools?—Generally speaking, we give a certain percentage of the expenditure, but in special cases, where there are special circumstances, we give them increased grants, but it is still a proportion of the expenditure. The normal rate of grant is one-third of the expenditure, but in special cases we give half; sometimes for depressed classes schools we give even two-thirds of the expenditure, because we think that they need encouragement.

31594. I understood from some of the previous answers that, in addition, you frequently make block grants for special purposes?—Yes, to local bodies.

31595. Are the subjects of chemistry and physics commonly taken up by students appearing for the Matriculation examination in this Province?—Yes, the majority of the pupils take them up.

31596. How is the equipment provided? On what sort of scale do you give aid for the provision of equipment in schools?—Of course, many of the schools are Government schools, in which case Government provides the whole of the equipment. In those that are not Government schools, we give furniture or equipment grants equal to half the expenditure.

31597. You have not found it necessary to give an additional grant for apparatus for those schools which are providing instruction in chemistry and physics?—We give grants for apparatus based on the expenditure.

31598. The normal grant, I think you said, was 50 per cent?—Yes.

31599. You have not found it necessary to offer, say, 75 per cent in order to encourage such provision?—No.

32600. We found in some Provinces very little was done in the teaching of these subjects owing to lack of apparatus. You refer to the fact that at one time agriculture was a subject for Matriculation, but it degenerated into text-book agriculture and was, in your opinion, valueless?—It did not degenerate; it never was more than text-book agriculture.

31601. And was entirely valueless?—I think so. The Principal of the Agricultural College said he preferred students who had not taken that subject at all, as then they did not have to unlearn what they had learnt.

31602. For how long did the experiment continue?—I cannot say. It was going on when I came to the Province. At that time we were affiliated to the Allahabad University. I was largely instrumental in getting that course cut out.

31603. I ask you because in several Provinces where that experiment has not been tried it has been suggested by witnesses?—I think it is a mistake to attempt it.

31604. Reference has been made to the statement, commonly heard, that Indian students are lacking in powers of observation. Do you know whether any competent educationist in this country has ever gone into that subject and made a report?—I do not think so. Personally, I have not found Indian students lacking in powers of observation. I had a great many of them through my hands as Principal of the Science College. They may sometimes lack those powers, but they can be developed.

31605. I had a good many students through my hands during six years in an Indian college, and my experience was the same. I found their powers of observation very good, if properly trained. But you are not aware of any discussion having arisen in educational circles on the subject?—No.

31606. You refer to the fact that regularity of attendance is governed by whether the children are wanted for work in the fields or not. Is any attempt made in this Province to arrange the school holidays so as to coincide with the busy season?—Yes, that is almost always done in rural areas.

31607. Does that necessitate a considerable difference in the periods during which holidays are taken throughout the Province? For example, are holidays given in the cotton-picking season in primary schools in cotton areas?—I cannot give you the exact dates, but school committees are allowed to make their holidays coincide with the busy seasons, and I know that they do so in many areas.

31608. Do you encourage them to take such action?—They naturally take it.

31609. *Prof. Gangulee:* Do you find the District Councils are keener on education than the Municipalities?—It is impossible to generalise. I hope the introduction of compulsory education in some Municipalities will encourage others to take it up, and that in course of time public opinion will become alive to its importance.

31610. Do you see any indication of that at present?—I am optimistic of the ultimate result.

31611. Do the reports of inspections of compulsory primary schools go to the local bodies as well as the Government?—They go chiefly to the local bodies. Reports about every little primary school do not come to Government, but the schools as a whole are reported on each year by the Deputy Inspectors, the Assistant Inspectors and the Inspectors, and also by the local bodies themselves; in addition to which the district officials make a report. We have a very complete system of reports.

31612. Government can follow their progress?—Yes.

31613. Do you find any improvement in the vernacular primers for these schools?—We have vernacular readers which were rewritten a short time ago under the direction of committees appointed for the purpose, and I think they are very suitable.

31614. Have you a Text-book Committee here?—Yes.

31615. Do all the primers go before that committee for their decision?—Yes.

31616. *Mr. Calvert*: You say the high schools are situated in towns. Does not the great bulk of your population live in villages?—Yes.

31617. You make the majority go to the minority?—If you put a high school in a village, the boys would have to come from the other villages round about; the boys in the village where the school was situated would provide only a small nucleus. The boys might just as well go to a town, where there is a larger nucleus.

31618. Does it not seem that towns have an amazing fascination for your department?—No, but towns are the centres to which all roads and railways lead, and we provide liberal hostel accommodation there for boys who come from the villages outside.

31619. You do not attach much weight to the complaint that you drag boys away from the villages for education?—None, because no other course is possible.

(The witness withdrew.)

Mr. AMANAT ALI, Burhanpur, Khandwa District.

Replies to the Questionnaire.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The agricultural class as a whole is dependent more or less upon village *sowcars* (moneylenders), and a great part of a cultivator's produce either in kind or cash goes to his moneylender. The result is that a few months after the harvest season is over, the poor cultivator is rendered penniless. Whatever surplus is left with him, if any, is spent in other wordly affairs, for example, marriage ceremonies, etc. The Indian cultivator keeps no provision for the future. He is regardless of it. Well then he must have sufficient money to meet his cultivation expenses throughout the year and finds no other source than to approach the *sowcar*.

Another cause is that all the produce of the farmer goes to the merchant through the broker, who settles all bargains between them. The cultivator knows very little about the current prices in the market and the proper men whom he should approach in disposing of his produce. Thus everything is left to the sweet will of his broker who reaps the real profit which otherwise would have gone to the producer.

(ii) The village *sowcar* is the main source of credit for the cultivator.

(iii) The moneylender is the greatest enemy of the cultivator. His principal object is to get as much interest from the cultivator as possible. An expert moneylender generally holds out hopes of lending money to him; but just at the time when money is needed most from him he tries to charge very high rate of interest or else does not stick to his word of honour.

Thus, in normal years, almost the whole profit of the cultivator goes to him as interest with the result that his principal remains fully unpaid, while in bad years the interest even is not satisfied. It is obvious, therefore, that if the cultivator once falls a prey he is never able to get out of the clutches of the *sowcar*.

(*b*) *Taccavi* loans should be granted more liberally at a low rate of interest and should be repayable not in a lump sum, generally speaking, but by means of instalments. The village *patwari* should see that the money so granted is not misused. I know many cases where cultivators obtained *taccavi* grants from the Government and paid it to the *sowcar*.

Yes, the Usurious Loans Act should be enforced and the Insolvency Acts may be made more applicable to farmers than to merchants.

QUESTION 10.—FERTILISERS.—(*a*) So far as dry farming is concerned, artificial fertilisers are of very little use. They are so costly that it is impracticable to apply them in dry farming practice. The increase in yield does not compensate the cost. I think that natural manures such as cowdung and city refuse can be more profitably used if properly preserved.

(*c*) Very little has been done to popularise the use of improved fertilisers. They are mostly used on the Government farms. Free experiments should be performed on private lands. At least one village in each *patwari* circle (where irrigated crops are raised) should be selected for such experiments, and the results shown to the cultivators.

(*f*) Scarcity of wood for fuel is the main cause of using cowdung as such. *Bona fide* agriculturists and labourers may be allowed to take fuel wood free from the Government forests.

QUESTION 11.—CROPS.—(*a*) (i) The Agricultural Department has no doubt done much towards the improvement of crops, but still a lot more remains to be done. Let us take, for example, the introduction of *roseum* cotton in the Central Provinces and Khandesh (Bombay Presidency). This cotton possesses higher ginning qualities and also gives a better yield. The area under *roseum* has increased by leaps and bounds. But lately cotton wilt has spread very considerably. *Roseum* is being replaced by *buri* (an exotic variety) in places where the soil and climatic conditions are favourable (round about Manjrod tract in Burhanpur tahsil). But it does not thrive everywhere, and, moreover, is not liked by mill-owners as the staple is very weak. The department therefore should try to introduce some other variety of cotton which can resist wilt to a greater extent.

Let us now take another crop, say wheat, which is an important *rabi* crop in Melghat tahsil of Amraoti district and in Hoshangabad and Betul districts. It is almost grown as a dry crop. In years of heavy rainfall and in places where cold weather showers of rain generally fall, wheat rust plays havoc. Certain strains of wheat have been selected at Pusa such as Pusa 4 and Pusa 12 which resist rust to a great extent. But then they are not *barani* varieties and are only suitable for irrigated tracts. Another drawback is that these are beardless varieties and much damage is caused by wild animals. The department should pay more attention to wheat raised as a dry crop and try to find out rust-resisting variety. I would strongly recommend that a wheat farm should be established in Melghat tahsil of Amraoti district, which tract is altogether neglected by the Agricultural Department.

(ii) Lucerne and clover are the two important fodder crops which can supply green fodder almost throughout the year. They are generally grown on the Government farms and are altogether unknown to the cultivators. They can very well be introduced. Experiments may be performed on private farms under well irrigation, and methods of cultivation shown to the cultivators.

(iii) The demand for pure seed is so great that the Government seed farms can hardly meet the requirements of the farmers. There are certain seed farmers connected with the department, as in Hoshangabad and Betul districts, who obtain pure seed from the Government farms and all their produce is distributed to other growers next year through the department. I like this system. My opinion is that such seed farms should be established in each tahsil or taluka and an association of well-to-do farmers and malguzars be formed through Government aid for this purpose. Seed depôts should be established at convenient places whence the pure seed would be available to farmers.

(iv) Wild animals generally inhabit neighbouring Government forests and great damage is done to crops in areas close to forest. Shooting is prohibited in the Government forest, except on permission for purposes of *shikar* and not as a measure for preventing damage. The Forest Department seems to have little or no sympathy with the agriculturists. In my opinion, free shooting permits should be granted annually to *bond fide* agriculturists on condition that they should report the number of wild animals killed. So also, licences for keeping arms for crop protection may be granted more liberally. This is the first step towards prevention.

Trees and shrubs growing on the banks of streams and *nullahs* (running through the cultivated tracts) serve as good breeding places for wild animals. The ryot is not allowed to cut these trees (as in Melghat tahsil of Amraoti district). If this restriction is removed much damage can be prevented.

Similar crops are grown on scattered areas. If neighbouring cultivators, after consultation, grow similar crops in fields close to each other, more efficient watch can be kept and damage reduced.

Growing a few rows of such crops as are not liked by wild animals, along the border of fields is a much safer remedy.

QUESTION 15.—VETERINARY.—(*a*) This department should be under the control of the Agricultural Department.

(*c*) (i) and (ii): No. The agriculturists still stick to their old methods of treatment, for example, the practice of "hot iron touch", which is very common. Agriculturists are a most backward class. The majority of the people have little or no faith in the so-called foreign medicines. Even if native-drugs are used, they think them foreign. People, even for their own sake, seldom seek medical assistance, much less the assistance of the veterinary dispensary for their animals.

Indifference on the part of the Veterinary Assistants and their demands for fees discourage the cultivators still more. If better people are appointed, the standard of pay increased, and efficient supervision maintained, this evil can be remedied.

(*d*) Except those contagious diseases which are most common, such as rinderpest and foot-and-mouth disease, all other contagious diseases are unknown to the public, (for example, anthrax and piroplasmosis). Infected cattle are sometimes segregated whenever possible but other preventive measures are not known. Assistants in the Revenue Department (*patwaris* and revenue inspectors) are the persons who usually come in touch with the cultivators. These men possess very ordinary educational qualifications. So that apart from the routine and prescribed departmental duties,

they cannot advise the cultivators in such matters when such a disease breaks out. If trained agriculturists are appointed as *patwaris* and revenue inspectors, these obstacles can be greatly removed. They are sufficiently trained for both these jobs.

QUESTION 26.—STATISTICS.—*(b)* In the Central Provinces and Berar, each tahsil or taluka is divided into so many *patwari's* circles and almost the whole work mentioned in sub-paragraph-(*a*) of this question is entrusted to *patwaris*. These *patwaris* are men of very low qualification and, so far as agricultural knowledge is concerned, they are quite ignorant. They are not competent to judge the general prospects of the crop and the yield estimation. Their reports are not based on facts, and wrong figures and information are sent to the departmental heads. In order to have men capable of doing such responsible duties, I would recommend that trained agriculturists may be appointed as *patwaris* or else these duties should be transferred to the Agricultural Assistants and the number of such Agricultural Assistants may be increased in each tahsil.

Oral Evidence.

31620. *The Chairman*: Mr. Amanat Ali, you come from Burhanpur?—Yes.

31621. What is your occupation?—Farming.

31622. You have given us a note of the evidence you wish to place before us. Would you like to add to that by any statement at this stage?—No.

31623. How many acres do you farm?—About 800 acres in one place and 150 in another.

31624. You farm that yourself?—Yes.

31625. Have you any other land apart from those 950 acres?—Yes, about 300 acres of barren land with no cultivation on it. I have started breaking it up with a tractor; I made a beginning last year and have already broken up 80 acres of it.

31626. Do you let any of your land out to tenants?—Yes, I own some villages and let my land out to tenants.

31627. Is that included in the 950 acres you have mentioned?—No.

31628. Do you farm the 800 acres you mentioned by means of an overseer and hired labour?—Yes, I have some agents who look after the cultivation, but I manage the whole estate myself.

31629. Do you carry on your farming operations with hired labour, or have you some arrangement with your labourers whereby they farm the land and share with you on some basis?—It is all done by hired labour.

31630. You pay solely money wages?—Yes, except in the case of servants who are paid partly in kind and partly in cash.

31631. Have you any difficulty in getting sufficient labour?—Yes.

31632. For how many years have you been farming in this district?—I have been in charge of my farm for the last 5 years.

31633. Is the difficulty owing to shortage of labour increasing?—Yes.

31634. How do you account for it?—The neighbouring region is well-populated and many cultivators are migrating there because they are getting land from Government, whereas the land where I am is being depopulated, partly owing to forest trouble and partly on account of unfavourable climatic conditions.

31635. What are your principal crops?—Cotton, wheat and gram.

31636. Are your lands irrigated?—No.

31637. Do you do any irrigation yourself by means of wells?—Yes, on a few acres of land, on which I raise vegetable crops and sugarcane, and I irrigate about 20 acres of wheat by well irrigation.

31638. How many wells have you?—Two big wells.

31639. Have they paid you?—Yes.

31640. At what depth did you strike water?—30 to 40 feet.

31641. What lift do you use?—An oil-engine and centrifugal pump. The wells are in different places, so that I have to use two separate plants.

31642. To the best of your knowledge, those wells have been a financial success?—Yes.

31643. Have you any tanks?—No.

31644. How did you equip yourself for this business of managing an estate?—This is my ancestral farm, and after getting my training at the Poona Agricultural College I took charge of it.

31645. For five years you have been in sole charge of this large estate?—Yes.

31646. Speaking frankly, what have you to say as to the value of the training you received at Poona?—I find it useful in certain ways.

31647. What do you think was the weakness of it, if there was a weakness?—I had not sufficient training in engineering.

31648. How about the commercial side? Were you trained in the science of marketing at all?—Not much.

31649. On the side of management?—We were trained on that side.

31650. Are you satisfied with the way in which you were trained in that direction?—Yes.

31651. How about the accountancy? Did you get any accountancy at all?—No; no accountancy.

31652. Do you know what I mean, farm accountancy?—Yes; we did not receive any training in accountancy.

31653. Would that have been an advantage?—It would have been. But I learnt my own accountancy after leaving the college.

31654. But did you learn accountancy from some one who had been familiar with the business of farm accounting?—Not exactly that; but I learnt general accountancy.

31655. But still, accounting on a farm is not at all an easy matter?—I did not find any difficulty.

31656. We should like to hear some of your experience in the matter of marketing crops. First about your own produce: how do you market that?—I take the whole of my produce of cotton to the market nearest to my village and I sell direct to the merchants or to the mills. We have mills in Burhanpur.

31657. How far is that from your estate?—50 miles.

31658. You take it by road?—Yes.

31659. Do you do it yourself in your own carts, or by contract?—I take it in my own carts.

31660. How long does that journey take?—About three days. I do not take my produce to the market in the first instance; I show my samples to the merchants or the mills.

31661. And you get better prices from the merchants or the mills?—Yes; I do not engage any middlemen or brokers.

31662. Whom do you charge with the duty of selling the cotton? Do you go yourself?—I go myself, mostly.

31663. And you of course keep in touch with the trend of the market?—Yes.

31664. And you hold out for a reasonable price?—Yes.

31665. Do you keep your cotton on your carts until you get the price that you think reasonable?—I have got godowns in Burhanpur and other places, and if I do not get a proper price I unload the carts.

31666. So you could afford to wait for the market?—Yes.

31667. Unfortunately, these are advantages not available for the small cultivator?—Yes.

31668. Can you express at all the difference between the average price that you get and the average price on the same day that the cultivator would get? What sort of difference do you put it at?—So far as cotton is concerned, I get at least Rs. 2 to Rs. 3 per *palla* more than what the average cultivator gets; a *palla* means 3 maunds.

31669. For the same quality of cotton?—Yes.

31670. How about marketing your wheat?—I dispose of my wheat on the spot or send it to Burhanpur.

31671. You sell it retail to the local consumers?—Yes.

31672. Or else?—Or else I send it to Burhanpur and store it there till I get good prices.

31673. Do you have any difficulty in keeping it in good condition?—No.

31674. How about your gram?—I dispose of it in the same way.

31675. Mostly locally I suppose?—Yes; most of my gram produce is given to my servants in kind.

31676. How about your sugarcane?—I grow very little of it.

31677. Is there a mill in the district?—No; sugarcane is only used for chewing purposes.

31678. I was interested to know that you have been growing vegetables on irrigated land. What about the market for vegetables?—I send them to the village bazars. We have different bazars in different villages on different days in the week.

31679. You send one of your servants to sell them?—Yes.

31680. Do you fix the price yourself?—No.

31681. He sells at the current market price in the bazar?—Yes.

31682. Is that a profitable venture?—It is.

31683. Do you think there is an opening for an expansion of that business?—Not in that place, because we do not have a good market; we cannot do the business on a greater scale.

31684. You mentioned this long journey that your bullocks do with the cotton. Do you take any particular steps to keep your bullocks in good condition in the season of fodder shortage?—I store a lot of fodder myself.

31685. What sort of fodder?—Wheat chaff. I have 200 to 300 acres under wheat and I store the chaff, and I also bring grass from the reserve forest and store it.

31686. You cut grass from the reserve forest and make it into hay?—Yes and keep it in stacks.

31687. Keep it under cover?—Not under cover; we simply thatch the stack.

31688. Have you considered, at all, the wisdom of adopting the scheme of preserving fodder known as ensilage?—Yes; if there is any shortage of fodder then we have to store it in the form of ensilage or hay.

31689. Do you make ensilage?—No; I do not.

31690. Do you believe in it?—Yes.

31691. Can you succeed in keeping your working bullocks in pretty good condition throughout the year?—So far as my bullocks are concerned, they are in good condition.

31692. One or two questions on the substance of your note: On page 386, in answer to our question as to *taccavi* loans, you suggest that these loans should be granted more liberally at a low rate of interest. Do you think there is any danger that cheap credit might mean heavy borrowing amongst the cultivators?—I do not think so.

31693. What wheat are you growing?—I grow different varieties of wheat mostly the local *pissi* and the local *bansi*. I have improved varieties from the Government farm and some varieties from Pusa.

31694. How are they doing?—They are thriving well. I am growing Pusa 4 and Pusa 12 under well irrigation.

31695. What are the improved varieties?—A 115 from Hoshangabad, A 68 and A 85.

31696. Are they greatly displacing the country wheat, do you think? Is the area under these wheats increasing?—I am distributing certain varieties of *pissi* wheat to the local growers.

31697. On what basis do you distribute?—I sell on cash.

31698. Cash on the spot? Or do you lend for a certain period?—I sell for cash on the spot.

31699. Are you engaged in any moneylending to your own tenants?—No.

31700. None at all?—None at all.

31701. I see your note with gratitude that the Agricultural Department has rendered important services, but you think they might do more. Do you think they could do more with the means at their disposal or do you think they should be given more financial means so as to carry out their work?—I think they have not got sufficient staff to carry on the work.

31702. They have not got enough demonstrators; is that the principal thing?—Yes.

31703. There are not enough men working in the countryside?—Yes, there are not enough men.

31704. I see here, to go back to the question of fodder, that you have noted that lucerne and clover are the two important fodder crops. Have you grown any on your own land at all?—I do grow lucerne.

31705. Has it been a success?—Yes.

31706. How many acres have you got under it?—2 acres.

31707. How many pairs of bullocks have you got?—60 in all, but I do not feed them all on lucerne.

31708. I understand that, from the number of bullocks you have and the quantity of lucerne you grow. Do you keep your bullocks throughout the year?—Yes.

31709. You do not sell and buy again?—No.

31710. Do you notice a growing confidence on the part of the ordinary cultivator in the recommendations of the Agricultural Department? Do you think there is a growing demand for advice and help?—I think so; but so far as my tahsil is concerned, it has been neglected by the Agricultural Department.

31711. You seem to have got the Pusa wheat all right?—That I did on my own accord.

31712. And in cotton you have got improved varieties, have you not?—Yes.

31713. There is a remark on page 387 of your note which I do not quite understand. I do not know what you mean by the practice of "hot iron touch". What exactly is a "hot iron touch"?—Suppose a bullock is unhealthy owing to some stomach trouble or some other reason, then people bring an iron sickle, make it hot in the oven and make a mark with it on the body of the bullock. Even the men sometimes, when they have a headache or something of that sort make a mark with that on the forehead.

31714. *Sir Ganga Ram*: You say that in the Poona College the engineering side is weak?—Yes; they are not giving sufficient training except in oil-engines.

31715. Can those boys design a suitable kind of pump?—No.

31716. Can they take the discharge of a well?—No; they cannot.

31717. Can you take the dischage of a well?—Yes.

31718. What discharge does your well give; how many gallons per hour?—6,000 gallons per hour.

31719. So much for one well?—Yes.

31720. It is worked by an oil-engine?—Yes.

31721. You have got two wells?—Yes, in different places.

31722. Are they circular or rectangular?—Circular.

31723. You say the beardless varieties of wheat are not good?—Yes; they are damaged by wild animals.

31724. What about the Pusa varieties?—They are beardless.

31725. Which variety of wheat do you grow?—A 115 from Hoshangabad farm; it is largely grown in Betul and Hoshangabad districts.

31726. Can you tell me what rotation you follow in your cropping?—I have a three years rotation. In the first year I plough my land and grow wheat, and next year I grow gram. Gram is a leguminous crop and it adds something to the soil; in the third year I grow cotton again.

31727. What is this cotton you call *buri*? Under what name does it sell in the bazar?—It goes under its own name of *buri* in the Buthanpur market. There are very few cultivators who grow *buri*.

31728. What is the yield per acre?—Three-fourths of the yield of *roseum*; it yields about 2½ maunds.

31729. Clean cotton?—No; whole cotton, *kapas*.

31730. Do you call that a good yield?—No.

31731. Then why have you taken to it?—I have not taken to it. It does not fetch a good price.

31732. What is the best one in your experience?—*Roseum*.

31733. What is the yield?—About 4 to 5 maunds per acre of *kapas*.

31734. That is not a good yield. What is a maund?—Forty seers, Bengal measure.

Roseum in the Punjab gives a yield up to 12 maunds.

31735. You do not of course require irrigation? In what month do you plant?—In June. The first picking is commenced in the month of November.

31736. Do you do any fruit culture?—No.

31737. Do you grow a lot of vegetables?—On a small scale.

31738. *Sir Thomas Middleton*: On page 388 of your evidence you refer to the estimates made of crops in your district and you complain that the *patwaris* who make the estimates are not well qualified. What proof have you got of this?—I had one case

in the year 1924 when we did not even have the first picking of cotton in the month of December and the *patwaris* reported the cotton crop to be 14 annas. I reported the matter myself to the then Deputy Commissioner at Amraoti, and after some time he came and he and I went to the spot. We took some cultivators with us and then we found that the crop was not more than 6 annas.

31739. Was that a case of just one *patwari* or were there more than one?—Generally, all the *patwaris* do this. I make enquiries from them and they always give me false reports, probably to please their higher officers.

31740. *Sir Ganga Ram*: You do not give them *faslana*, *i.e.*, allowances at harvest time?—No.

31741. *Sir Thomas Middleton*: Do you grow no *kharif juar* on your 800 acres?—Yes, about 40 to 50 acres.

31742. Is that enough for all the fodder you require on your estate?—It is enough for my servants.

31743. You must have a large area of fallow in the *kharif* season?—I grow cotton. I use half the area on my estate for cotton and *juar* and the rest for *rabi* crops, that is about 400 under *kharif* and 400 under *rabi*.

31744. But during the *kharif* season about 400 acres will be fallow?—Yes, preparing for the *rabi*.

31745. How much of your *rabi* crop is wheat and how much gram?—About 200 acres wheat, 100 acres gram and 100 acres miscellaneous crops.

31746. What miscellaneous crops?—Lentil, coriander, linseed, *lakh*, etc.

31747. Have you tried growing ground-nut on your land?—It is not fit for ground-nut; it is too heavy.

31748. *Sir Ganga Ram*: No rape seed?—No.

31749. *Sir Thomas Middleton*: How many agents do you require to look after these 800 acres?—I have two agents.

31750. Is each of these men put in charge of about half the area?—Yes.

31751. Are they paid entirely in cash or partly in cash? Do you give them a bonus on the results?—No.

31752. Have either of these men been to college like yourself?—No; but they have got a lot of experience. One of my agents has been cultivating for the last thirty-five years.

31753. And you find that the combination of your college training and their experience is useful?—Yes.

31754. You mentioned that you get one rupee per maund more for your cotton than the average market price. That is for clean cotton?—Not for clean cotton; it is for *kapas*.

31755. That is a large advance?—Yes.

31756. Have you any special new strain, or any particularly good kind of *roseum* cotton?—Not anything like that, but the brokers and middlemen cheat the cultivators with different rates.

31757. Are you well satisfied with the *roseum* cotton you are growing?—Yes.

31758. Have you had much wilt disease?—Not in my place.

31759. *Prof. Gangulee*: In the neighbourhood?—Yes, but not on my land. In the adjoining district of Nimar they have had wilt.

31760. *Sir Ganga Ram*: You have not tried Punjab-American cotton?—No.

31761. *Sir Thomas Middleton*: You have got about 60 pairs of bullocks. How many cows have you?—About 80 cows; they are not the milking breed. I keep them for breeding purposes and for manurial purposes only.

31762. You must have a large quantity of manure to dispose of?—Yes, I use the manure myself.

31763. On what crop does the manure go ?—First on my irrigated crops and then on cotton.

31764. How much of your cotton land will you be able to manure each year ?—Not more than 100 acres.

31765. About how much do you generally give ?—About 10 cart loads per acre.

31766. Can you see a very marked result from those 10 cart loads ?—Yes.

31767. Have you made any estimate as to the increased amount of cotton you get ?—I get about 25 per cent more yield.

31768. You mentioned that you were getting five maunds of *kapas* per acre. That is a very high yield for your district ?—It is normal.

31769. What is the yield this year ?—This year is a very bad year. I shall hardly get two maunds per acre.

31770. *Dr. Hyder*: You suggest that to avoid this wasteful practice of burning cowdung *bona fide* agriculturists should be allowed to take fuel free from the Government forests. Do you not see the possibility of re-selling it to people who are not *bona fide* agriculturists ? Would not this question arise ?—They cannot sell it because they would not be able to remove it outside the locality; there are different *nakas* where they are checked by the forest people.

31771. Are you satisfied with this *buri* cotton or would you like to have more varieties ?—Yes, I want more varieties.

31772. Have you ever corresponded with the man who is in charge of the department at Akola ?—I have not corresponded with him but I know that they have not go a better variety of *roseum* or *buri*

31773. He should be able to put you on the track. What is this difficulty with regard to the cutting of trees in areas which are infested with wild animals ? Is it because the land belongs to the malguzars ?—No, the land belongs to the Government but the ryot is not allowed to cut trees growing on the banks of *nullahs*.

31774. Do the *nullahs* run through the ryots' lands ?—Yes, for instance, a big *nullah* runs through my farm and there are many trees growing on the banks of that *nullah* which I am not allowed to cut; and these trees harbour wild animals.

31775. *The Chairman*: But do they not help to keep the banks of the *nullah* solid and thus prevent erosion ?—Yes, to a certain extent.

If you cut those trees they would cease to do that.

31776. *Sir Henry Lawrence*: What is the reason for that prohibition ?—In order to prevent the erosion of the soil.

31777. *The Raja of Paylakimedi*: You say that the cultivators are practically ruined by the moneylenders. May I know what is the rate of interest charged ?—At my place they charge 100 to 300 per cent.

31778. And when do they recover ? Do they recover quarterly, or half yearly ?—They recover sometimes only the interest and the original amount is left as it is, or they add some more interest to the principal and it increases every year.

31779. Does this system apply when it is collected in cash as well as in kind ?—Yes.

31780. For cash and kind the same rate of interest is charged ?—Yes.

31781. Do you not try to protect your cultivators by advancing money to them ?—I do not do any moneylending business myself.

31782. Simply as a philanthropic measure, do you not advance any money to them ?—I do not.

31783. You simply pay their salary, and if they have to borrow you leave them to the moneylender ?—Yes.

31784. In your part of the country, do you observe among the ryots a general tendency towards taking up improved methods of agriculture?—They are quite ignorant of all these methods; they do not know whether any Agricultural Department exists in the Province.

31785. You are adopting improved methods?—Yes.

31786. Do you not give your neighbouring ryots the opportunity to come and see what you are doing?—Unless they are well canvassed, they are indifferent to all this. I cannot do propaganda work myself, as I have to look after my own lands.

31787. Is your land in an isolated area?—It is all cultivated area.

31788. Your farm exists in the midst of cultivated area?—Yes.

31789. Do the neighbouring cultivators try to adopt some of your methods?—Some of them take improved varieties of seed from me.

31790. Do you always welcome that sort of thing?—Yes.

31791. Has that practice been growing year by year?—Not much.

31792. What fertilisers do you use?—Farmyard manure; I do not use artificial fertilisers.

31793. Are the ryots in your neighbourhood copying the same methods of applying manure?—Yes.

31794. Do they use farmyard manure?—Yes, but a lot of manure is wasted for burning and plastering purposes. They plaster their walls and floors with cowdang.

31795. For your own fuel purposes, how do you manage?—I get fuel from the jungle.

31796. Is it by application to the Forest Department?—We pay them regular fees, and we obtain a license from them. Whenever we want 10 cart loads of fuel, we buy the license and bring the fuel.

31797. What is the rate charged per cart-load?—The rate is 8 annas per cart-load of dry fuel.

31798. Do they restrict you from removing any superior material?—Yes.

31799. Do they give you a list of timbers that you are not to touch?—Yes.

31800. To meet your demand for fuel, have you ever thought of raising a plantation?—No; that would mean that I would have to leave out a large area of land.

31801. Can you not grow it on your field banks?—No.

31802. The whole of your land is under cultivation?—Yes.

31803. You say that in Government farms lucerne and clover are grown. Is it because Guinea grass will not grow in that locality?—I cannot say.

31804. Do you not know Guinea grass?—Yes, I do.

31805. Do you not think it would grow better than lucerne if you tried it?—I have no experience of that.

31806. You say that your part of the country is much affected by pigs?—Yes.

31807. Is it entirely from Government forests or from malguzar forests also?—We have no malguzar system in Berar; it is entirely from Government reserved forests.

31808. Are there any restrictions laid down which hamper the destruction of these animals?—We cannot go to Government forests for killing any wild animals or game unless we obtain a permit.

31809. But when they come to your fields, you can kill them?—Yes, and we do.

31810. With greater organisation, can you not take more effective measures to scare away these animals from coming to the fields?—We can drive them to the forest demarcation line, but we cannot enter the forest.

31811. But there must be some distance between the forest and your fields?—The forest is within 4 miles of the village.

31812. When you suggest a free grant of licenses to cultivators, do you mean only for pigs or for all animals?—All wild animals which damage crops, pigs, deer, and other animals.

31813. Would you not restrict it to areas adjoining cultivation?—No.

31814. Right through you would suggest the grant of free licenses?—Yes.

31815. *Sir James MacKenna*: Do you know many young gentlemen of your own class who have taken courses at the Agricultural College and gone back to their own estates?—Only a very few.

31816. I asked you the question, because I think you are the first gentleman of that kind whom we have had the pleasure of meeting. Do you think there is real demand for agricultural education from young men of your class?—Yes.

31817. Do you think that the college should cater for gentlemen like yourself?—Yes.

31818. *Prof. Gangulee*: Are you a member of the Tahsil Agricultural Association?—I am not. There is no Tahsil Agricultural Association in my tahsil.

31819. You are in touch with the Department of Agriculture?—Yes, I am.

31820. In what way are you in touch with it?—I get improved varieties of seed from them, and I get machinery through their advice.

31821. Do the officers of the Agricultural Department visit your farm?—They visited it once, a few days back.

31822. In what connection?—They wanted to inspect my well and the irrigation scheme at my place.

31823. When you require any assistance from the Agricultural Department you write to them?—Yes.

31824. How far from your farm is the nearest seed depôt?—Akola or Hoshangabad.

31825. Do you yourself distribute seed to the neighbouring farmers?—I do, if they come to me.

31826. You have just said that the farmers in the neighbourhood are not aware of the existence of the Department of Agriculture. Have you made it known to them?—I have made it known to them. I have spoken to the department so many times about it.

31827. On page 386, you say that very little has been done to popularise the use of improved fertilisers. What fertilisers have you in mind?—Ammonium sulphate, nitrate of soda, and phosphates.

31828. You have been experimenting with those fertilisers?—I do not have any experience of them on my own land, but I had some experience of them in the college.

31829. You have never tried any phosphatic or nitrogenous manures?—No, because I get cowdung.

31830. When you spoke of improved fertilisers, you merely spoke from your previous experience in the college?—Yes, and from the reports of the department.

31831. Do you keep farm costings and accounts?—Yes, I do.

31832. I take it that you practise dry farming?—Yes.

31833. You say in your note that the increase in yield does not compensate the cost. Do you base that remark on your own observation or your own experience?—It is based on the reports of the Agricultural Department.

31834. You practise dry farming?—Yes.

31835. And you say here that increase in yield does not compensate the cost?—Yes.

31836. Has that been your experience?—That has not been my own experience but I know that it is so from the reports of the department and of those people who have experimented on it.

31837. In your own experience it does pay?—I have not tried it; I think it will not pay. Artificial fertilisers are very costly, and it is quite impracticable to apply them on dry farm practice.

31838. It is quite impossible?—Yes.

31839. Do you carry on any experiments in your farm?—I do.

31840. What is the nature of your trials?—They are varietal experiments.

31841. Do you have frequent outbreaks of cattle disease in your neighourhood?—Yes, we have them sometimes.

31842. Do your own cattle suffer from any disease?—Yes.

31843. Who treats your cattle when they need veterinary help?—There is a Veterinary Asisstant belonging to the department.

31844. On page 387 you say that inattention on the part of Veterinary Assistants and their demands for fees discourage the cultivators still more. Do you have any specific instances in mind?—I have one case.

31845. There have been complaints from the neighbouring farmers?—It is a complaint from myself.

31846. Is that the opinion of the neighbouring farmers?—It is. In one case, the Veterinary Assistant visited my cattle twice and afterwards sent me a bill of Rs. 5 per visit. I re-directed the bill to the Deputy Commisioner. He consulted the Veterinary Inspector, and decided that the Veterinary Assistant had no power to demand fees, that it was his duty to treat the cases free of charge.

31847. What happened to your application?—They instructed the man not to charge me anything.

31848. Do you buy cotton from the neighouring farmers?—No.

31849. *Mr. Calvert*: From your experience, do you believe that the proper method of propaganda is to demonstrate to the bigger landowners, or to try and demonstrate to groups of small cultivators?—It is better to demonstrate to groups of small cultivators.

31850. Do you think that there is any scope for educated gentlemen like yourself to increase their income by taking in apprentices and teaching them agriculture in return for fees?—I think so.

31851. There might be scope for it?—Yes.

31852. *Sir Thomas Middleton*: You stated in reply to a question by me that 400 lbs of *kapas* was your normal crop. What do you mean by normal?—Was that a 13 anna crop?—Yes, it was a 13 anna crop.

31853. You keep about 80 cows for breeding purposes. What breed are they?—The local hill breed.

31854. Do you employ bulls from your own district, or do you import bulls?—I have got one Montgomery bull from the department. I have selected cows for milking purposes, and I leave the stud bull with them.

31855. But for general breeding purposes, what bull do you use?—Our own local breed.

31856. When these cows calve, do you allow them any cotton seed?—No.

31857. None at all?—No.

31858. How are they fed?—They are fed on green grass and dry fodder, wheat chaff, etc.

31859. They will be calving, many of them I suppose, in April, when you have no green fodder?—I keep the herd of cows in the jungle where we have dense forest and I pay fees to the Forest Department. On the banks of *nullahs* and streams in the forest, there is green grass growing even in the months of April and May.

13860. I thought you kept your cows on your own farm?—No.

31861. *Sir Henry Lawrence*: What fees do you pay to the Forest Department?—8 annas per cow.

31862. *Sir Thomas Middleton*: 8 annas per cow for what length of time?—For the whole year.

31863. *The Chairman*: What is your ginning percentage?—For *roseum* it is about 39.

31864. How often do you plough when you are preparing land for cotton?—Once in three years

31865. And for wheat?—I follow a rotation. I plough my land for wheat, and then grow gram and cotton, and in the fourth year I plough the land for wheat.

31866. Your land is actually ploughed once in three years?—Yes.

31867. What form of tillage do you carry out in between these ploughings?—Do you break up the surface with an iron harrow, or anything of that sort?—Yes, I use an improved disc harrow and an ordinary country blade harrow.

3.868. *Sir Ganga Ram*: What the Chairman wanted to ask you was, how many times you plough before putting the seed in?—I only plough once in three years. I harrow before putting the seed in, at least 6 times in the case of wheat and 4 in the case of cotton, with a disc or blade harrow.

(The witness withdrew.)

MR. B. G. KHAPARDE, B.A., LL.B., M.L.C., AMRAOTI.

Replies to the Questionnaire.

QUESTION 1—RESEARCH.—The indigenous theory and traditional methods of agricu ture in Berar are so simple that they do not admit of much labour on research in that direction. As to the scientific value of the same it should not be difficult to determine it when they are compared with the modern methods and the experiments carried on in Government farms. What is really needed is the gradual transformation of the "traditional" methods of agriculture into the modern methods, as the Berar agriculturist is slow in adopting anything new of which he has no experience and does not believe in giving up old methods in favour of a new one.

The research department should be independent of the administrative department of agriculture and the administrative department should include propaganda work.

The research as well as administrative branches should be entirely in the hands of Indians. A capable person who can take charge of the research department should be found in India. The word "Expert" generally connotes a foreigner who comes out to India with ideas of his own and is completely ignorant of local conditions. He takes a long time to acquaint himself with the local conditions and needs and considers himself too superior to take advice from indigenous experienced men and mismanages the department in his charge. By the time he gathers enough of experience it is time for him to retire and he goes out of India, and with him go all the useful researches if he had made any. An Indian, on the other hand, lives and dies in India and even after his retirement he can be useful to the public in various ways.

The public should not be taxed either directly or indirectly for carrying on the research work. The public is kept generally ignorant of what goes on in the laboratory from day to day; and, as no time can be fixed for a particular research being made suceessful on account of the nature of the work of the department, its head can always speak of experiments being conducted without pointing out definite results and this is supposed to be a good excuse for the want of any tangible result.

As for financing I suggest that, after anything beneficial is found as a result of any research work, the agriculturists who want to take advantage of such results should be charged small fees for making use of that knowledge. This will put to test the real utility of the research and the cost of the research can always be realised if the research is really worth anything. It will also give work to the propaganda department as they will have necessarily to spread wide the knowledge of such research and induce the agriculturist to put it to test and use the same. The research is bound to pay its own costs and be popular if it is really useful. No money should be spent on travelling and visits of experts, either to parts of India other than the one in which the institute is located or other countries, unless a strong case is made out for such visits and sanction for the same is accorded either by the central or local Council as the case may be.

(c) Cotton crops are often spoiled or completely destroyed by a kind of worm which eats up the leaves and cotton bolls. The same thing often happens to *tur*. A particular kind of weather condition is supposed to bring on this trouble. The real causes leading to this disaster can be investigated and if they are found out immense good can be done to the agriculturist.

QUESTION 2—AGRICULTURAL EDUCATION.—(i) There is no institution in Berar for agricultural education and the want is very much felt.

(ii) There is an urgent need for teaching facilities in all districts of Berar and I suggest that such an institution be established at some central place in Berar, *e.g*, Amraoti or Akola. One institution in each district may be established later on, as necessity arises.

(iii) Yes.

(iv) The only stimulant for a demand for agricultural instruction seems to be a prospect of making money which the student does not hope to come by otherwise.

(viii) Nature study is useful to all students in schools and may be made a compulsory subject. So are school plots on a small scale. But school farming should be kept optional and only those who expect to do farming in their future careers may be expected to work on the school farm. The other courses of study will need to be revised. As it is, the boys are overworked in the schools.

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(ix) Those who have studied agriculture have done so with a hope of securing some kind of service. Even those who have land of their own have not taken to agriculture but have sought other employments if they could not secure a post in Government service.

(x) The only way to make agriculture attractive to middle-class youths is to demonstrate to them that for a proportionate expenditure of time, energy and money, they have a better prospect in this line than in any other.

(xii) I have heard of several schemes of adult education if that phrase means only reading and writing. Tapswi Babasaheb Prajanjpe's scheme has been tried in some parts of Yeotmal district with varying degrees of success. Mr. Mande who has lately come back from America has a workable scheme and those that have closely examined it think it to be a very good scheme of adult education and one which promises well. Mr. Mande has given some popular demonstrations of the same in several places with great success. If "education" includes also other things such as powers of observation, manners and morals, I think an adult person in rural tracts of Berar is, man for man, as good as any in other parts of the country.

(xiii) The schools started partly for agricultural instruction should be controlled by the Agricultural Department. The expenditure for these schools should be met from the fees that may be realised from the pubils, donations from well-wishers, and the grants from Government. In no case should these institutions be additional burden on the land.

QUESTION 3—DEMONSTRATION AND PROPAGANDA.—(*a*) Nothing improves the practice of cultivators better than actual demonstrations.

(*b*) The effectiveness of the field demonstration can be increased by occasional agricultural shows in which encouragement should be given to those who produce the best articles, and by touring lecturers who can speak the language of the people among whom they move. Demonstrations should be made in the fields and on the soils of the agriculturist, even at the cost of the Government if necessary. Men of limited means should be shown how things can be managed more economically and how machinery or improved implements can be used to save labour.

(*c*) Cultivators are very slow to adopt expert advice because they do not believe in experts. They believe in their own methods and unless other methods are shown to them to be superior to theirs by actual demonstration, they will not adopt them. Nothing will be gained if the expert waits for them to come to him for advice. The expert must approach them, be not discouraged by their apathy, persist in giving his advice, and be not disappointed if it is not adopted. If this continues for some time and if people find that those who adopted expert advice have derived profit, the villager may be expected to take an interest in the matter.

(*d*) On my own land, a particular method of sowing cotton was adopted with some advantage. The villagers round about noted the same from year to year and never adopted it because they thought it would be costly on a large scale and might prove a failure in the end. The Berar peasant is very conservative and takes a long time to imbibe new ideas.

QUESTION 4—ADMINISTRATION.—(*a*) and (*b*). The Government of India will be able usefully to supplement the activities of the Local Government if it does not rigidly control the Local Government in its activities, but contents itself by giving advice when asked for. In case the Government of India rigidly controls the provincial activities, misunderstanding is likely to arise. The Government of India may not always appreciate the particular conditions that obtain in a particular Province. I do not think that the expert scientific knowledge required for the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the staff of the Government of India. The local and provincial conditions vary so much and their needs are so different that it does not seem practicable to collect a staff together which will be able to cope with the requirements of all Provinces. It will be disproportionately costly and comparatively less useful.

(*c*) (iii) The condition of roads in the country in Berar is very unsatisfactory and need special attention as they cause very great inconvenience to the cultivators.

(iv) The Meteorological Department is practically non-existent, so far as the Berar agriculturist is concerned; a useful purpose might be served if the agriculturist is placed in possession of correct information about the likely changes in the weather, to enable him to guide his activities accordingly. It is likely that the agriculturist in Berar who entirely depends on the mercies of nature will be immensely benefited by such information.

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(v) and (vi) The Posts and Telegraph services are inadequate. More villages should be linked by opening more post offices. This may not be possible from a merely commercial point of view but is essential for the benefit of the agriculturist.

QUESTION 5—FINANCE.—The general indebtedness of the agriculturist in Berar is increasing as may be seen from the reports of the Registration Department. The co-operative societies should be induced to advance loans at cheaper rates. The land, on an average, does not return more than about 8 to 10 annas interest (per cent per month) on the capital and the expenses of cultivation This means that in order to be able to make a margin of profit and render agriculture reasonably paying, the agriculturist should be able to borrow money at less then 6 per cent per annum. At present, the agriculturist of Berar sticks to his land more from a sentimental point of view than from a commercial point of view and feeds himself on the uncertain hope of getting a good harvest every year. On account of the fluctuation of the market within a very wide margin, his income is extremely uncertain and he runs considerable risks in borrowing at high rates. Co-operative societies therefore must be started with the avowed object of giving capital at a cheap rate of interest and a regular propaganda is necessary even then to induce the agriculturist to take advantage of these institutions. The average agriculturist is very reluctant to go through the formalities of filling in several forms, and, never being accustomed to make punctual payments, feels that the society rules work very hard against him. Not infrequently, he chooses to undertake to pay a high rate of interest and mortgages his lands with a moneylender rather than take advantage of a co-operative society. The stringent manner in which the rules of the society have sometimes to be worked out go against the grain with him and he chooses to deal with an individual, and prefers to take the chance of mercy and tolerance being shown to him in times of distress and need rather than deal with a corporate body where mere personal relations cannot help him very far.

At present, in the large majority of cases, long and short-term credit is provided by the *sowcar*, the moneylender I am not aware how far the co-operative societies will be able to accommodate the cultivator for short-term credit. But if this cannot be done, the agriculturist will necessarily have to depend on the moneylender for his short-term credit. But the cases of promissory notes being given by agriculturists in Berar for borrowing money for cultivation are very rare indeed and do not raise any serious question.

(*b*) I think the problem is otherwise. It is the Government in Berar which is not very anxious to advance Government loans of *taccavi*. In Yeotmal district, *taccavi* was persistently asked for and refused some time ago. The procedure adopted by the Governmet in advancing loans is irksome and dilatory and it is necessary to adopt some other speedy method. Perhaps the proposal of maintaining a special staff for this purpose, either permanently or temporarily, may be considered with advantage. It is also necessary that some attention should be given to see how the loan is utilised. Some cases of misuse have been observed.

QUESTION 6—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are want of method in life, want of foresight, enhanced cost of living on account of the prices of necessities having gone up, shortage of rain, and consequent frequency of years of scarcity and famine.

(ii) The main source of credit is the moneylender, *sowcar*. Co-operative societies also come in but they are not the chief source. Government help does not count for much as it is on a very small scale comparatively.

(iii) The main reason that prevents repayment is the same as causes the necessity of borrowing. Very often the cultivators borrow with a full hope of a good harvest and are confronted by a bad year. Successive bad years are not an infrequent occurrence. Want of frugal habits also adds to the evil. Sometimes the moneylender creates a sense of ease in the debtor, purposely with a view to increase the debt when he is sure that his money is safe.

(*b*) It would be worth while to try an experiment by taking measures to deal with rural insolvency, and the application of the Usurious Loans Act. Redemption of mortgages may be faiclitated by relaxing the law a bit. But this may not prove very effective as redemption suits are comparatively few.

(*c*) Measures taken to restrict or control the credit of cultivators by limiting the right of mortgage or sale may hamper the agriculturist in his life and daily dealings. Perhaps they may frustrate the very object for which they have been adopted. Such restrictions may hamper the free distribution of land and militate against the rights of ownership in land of the cultivator. Such measures may turn out intensely unpopular and defeat their own purpose.

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QUESTION 7—FRAGMENTATION OF HOLDINGS.—(*a*) So far the problem of fragmentation of holdings is not in any way serious in Berar. Small holdings in Berar are not uneconomical merely because they are small. An owner of a small holding incurs proportionately small expenses and sometimes he is better off in that respect than the owners of comparatively large holdings, as he and his family work in the field and thus save the cost of labour; he may also get the field operations done by hiring bullocks from his neighbour and rid himself of all expenses attendant on their ownership.

(*l*) I do not think any fresh legislation is called for on this account. The present law is competent to deal with all cases likely to arise.

QUESTION 8—IRRIGATION.—We, in Berar, are so hard up for water that the thought of irrigation looks more like a dream than a reality. There are very few tracts where irrigation may be possible but that problem has not yet been gone into. There was a discussion about it in the local Legisative Council but nothing has yet come out of it.

QUESTION 9—SOILS.—(*a*) (i) and (ii) Drainage for draining off the rain water from fields is necessary in many cases in Berar. The average cultivator is generally ignorant of the principles of drainage and is content to bear with such loss as may occur rather than worry himself about it. A survey of all the Berar land should be undertaken from this point of view and the owner of the soil should be advised *gratis* as to the steps it may be necessary for him to take on this account. Cultivators should be shown how an economical and systematic *bund* may be erected to prevent a rush of water on the land and the washing away of the soil.

(*b*) I can give an instance of my own soil having undergone marked improvement within my recollection. I own a field near Ellichpur at Khudanpur. In a part of the field, there was a gradual slope over which the rain water flowed freely and swept off the surface soil. I got a long *bund* of loose stones erected at the end where the slope terminated and allowed it to stand for some years. The consequence was that earth from other part of the field gradually accumulated near the *bund* year by year, till the whole slope became a level and no water accumulated as it percolated through the loose stone wall. The field is now almost level and the soil near the *bund* is the most productive part of the field. A different part of the same field is being swept off year by year by a river when it is in flood during the rains with the consequence that that particular part of the field has visibly deteriorated.

(*c*) I have not known instances of cultivable land going out of cultivation unless on account of being reserved as a pasture by the owner for his cattle or for some other purpose. But if the land has gone out of cultivation on economical grounds, *i.e.*, if it is not possible to take out of it even what is spent on it in tilling and cultivating and in Government assessment, the only way of bringing it under cultivation is to reduce the assessment or give other facilities to the owner to induce him to work on the land.

QUESTION 10—FERTILISERS.—In my opinion, greater use could profitably be made of natural manures rather than artificial fertilisers under conditions obtaining in Berar. In the first place, the cultivator has not much new to learn as he has been using them. In the second place, he can obtain them from his own and his neighbours' animals, and thirdly, he finds them cheap and knows the proportion in which to use them. Artificial fertilisers are more costly. They are as a rule more concentrated and need a regular supply of water, which the Berar cultivator cannot obtain as he has to depend on the rains. Artificial fertilisers can be effectively used on irrigated lands as the cultivator is able to control the supply of water. The cultivator in Berar ought to be taught how to economise and conserve his resources. He should be taught the use of dung pits, the way in which they ought to be constructed and the way in which they should be filled. Ordinarily, the pit is not protected either on the sides or from above and the ingredients which supply food to the plant disappear in the soil of the pit or are rendered ineffective by the sun. I have seen a farmer ingeniously protecting his pit from sunshine by planting papaya trees round about it so that he derived fruit from the trees while their shade protected the ammonia in the manure. Another direction in which improvement is possible is to teach the cultivator to accumulate the urine of his cattle by contriving to soak in it some cheap absorbent, such as useless straw or black soil, and store it in the pit every day. A lair of this material, followed by another of waste grass and dung alternately, has been found of great use by me in my farm. The cultivator must be taught also the use of ash which is daily thrown away as waste. A minute study of the habits of the villagers will reveal many ways of helping them to an observant eye. If the Agricultural Department shows a genuine sympathy towards the village cultivator and tries to improve his method rather than saddle new ones on him, I think much can be done in this direction.

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(*c*) New and improved fertilisers can be popularised only if it can be demonstrated to the cultivator that they are cheap in the end and yield better results than the fertilisers he uses, and even the ordinary average cultivator of Berar will watch the experiment for two or three years before he can be induced to use them. The best way of doing this is to select a few typical villages where the majority of the cultivators are comparatively more intelligent than the average, and where a wealthy sympathetic and intelligent man resides; experiments at Government cost must be shown to the villagers so as to get them popularised and advertised. Products of these fertilisers should be shown in shows and exhibitions.

(*f*) I think it is impracticable to prevent entirely the use of cowdung as fuel until equally cheap or more cheap, and equally readily obtainable fuel, is substituted for it, which under the present circumstances looks very improbable of achievement. Wood under all circumstances is more scarce and more costly. Coal cannot reach the interior of the country and the villages. The use of kerosine oil and stoves is out of the question unless serious inconvenience and very frequent and fatal accidents are bargained for.

QUESTION 11—CROPS.—(*a*) (i) and (ii). Existing crops can be improved by a more scientific method of sowing them. I have been able to show marked improvement in the cotton crop by sowing the plants at the distance of at least 12" to 16' in squares. This gives them more room for growth under the soil, more air and light, and the stems of the bolls become more stout so that the bolls or leaves do not drop in case heat radiates from the soil after a light shower. In thickly sown cotton this is invariably the case. The same is true of *juar* and *tur*. A rotation which includes ground-nut crops keeps up the strength and fertility of the soil. Very often a part of the field is very thickly sown with *juar* so that the cane is thin and serves as a good fodder, while the rest of the field is sown by the ordinary method. I have seen thornless cactus being grown in Madras, which serves as fodder in famine times.

(iv) Amongst wild animals, pigs cause the most devastation and measures should be adopted to kill them. A free grant of licenses for guns is one of the solutions. Parties of hunters may be formed and their services may be utilised by the villages most infected by these animals. Special attention should be given also to loose cattle which do very great damage to the crops.

(*b*) Ground-nut can be cultivated with advantage. It is to be regretted that the old Indian long seed is dying out and is being replaced by one of the new sort which is short and round. The latter has more percentage of oil and pays more, commercially, while the former is more valuable as food as it does not disturb the liver.

(*c*) See (*a*) (i) and (ii) above.

QUESTION 12—CULTIVATION.—(i) The existing system of tillage can be improved upon by a judicious use of the plough. Some cultivators in their anxiety to secure good crops plough the land too often. I think ploughing the land once in four or five years should keep it in good condition. The agriculturist has recently taken to hoeing more seriously and has begun to understand its importance and use beyond mere removal of weeds. The agriculturist ought to be given to understand how the moisture is preserved in the soil by disturbing the uppermost surface of the soil.

(ii) Very often cotton is repeatedly sown with the hope of securing more money. But the cultivator has found out that this spoils the land and reduces its fertility. It is customary to rotate *juar* with cotton. Since the introduction of ground nut it is rotated with *juar* and cotton. *Til* and linseed are sown off and on and *baru* is sown in fields which have ceased to give proper yield. *Baru* is a good green manure and if rotated once in 5 to 7 years helps to keep up the quality of the soil. But as it does not bring in as much money as other crops do, cultivators are generally reluctant to sow the same unless the quality of the soil has gone down to an appreciable degree and has ceased to yield a heavy crop. Wheat and gram absorb the nutritious elements in the soil more than any other crop while *lakh* can be produced in comparatively unproductive soil. The experimental farms ought to settle a course of rotation after careful experiments, and give advice accordingly to the village cultivators after examining the local conditions and the quality of the soil.

QUESTION 13—CROP PROTECTION.—I have not observed any efficacious method being adopted for the prevention of external infection, pests, or diseases on a large scale. Small experiments in an acre or two, even if successful, bring no benefit to an agriculturist unless they admit of being repeated on a large scale. I have observed some plants being sprinkled with some kind of disinfectant but it is almost impossible to do so all over a field extending over several acres.

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(ii) Surely it is desirable to adopt internal measures against infection. I have observed *juar* being soaked in a mixture of, I think, copper sulphate and it was claimed that a crop derived from that seed was free from being infected by a certain worm. I have not myself seen the experiment being carried out and I am not aware with what degree of success this is possible. But experiments in this and similar lines are very desirable and necessary.

QUESTION 14—IMPLEMENTS.—(*a*) The sowing implement called the *tiphan* needs some improvement to begin with. In the present system of sowing, thick or thin sowing entirely depends on the operator's clumsiness or skill. It is rare that uniform sowing is observed by a trained eye. Some kind of improvement must be made by which it should be possible to regulate the sowing automatically and uniformly. This will do immense good to the cultivator especially in the case of cotton and *juar*. The growth of these crops greatly depends upon whether they are thickly or thinly sown.

The Indian hoe needs some improvement so as not to injure young plants. I have seen tractors working but have not had satisfactory reports about them. I do not believe a tractor can work very successfully on Berar soil at any rate. The initial cost is prohibitive to begin with. The working cost, I am informed by those who have used them, is more than that of the Indian plough and one landholder hardly possesses lands adjoining each other to an extent which will ensure an economical use of a tractor. Indian firms with Indian capital ought to be started to manufacture new implements according to local needs, and Government should subsidise and encourage such concerns as Kirloskar's in the Deccan.

(*b*) Ocular proof and demonstration are the only two means by which the Berar agriculturist may be induced to adopt new and improved machinery and implements. There should be no haste in this respect and the implements should not be forced on the cultivator. It sets him against them and creates a prejudice which may not be easy to remove.

QUESTION 15—VETERINARY.—(*c*) The agriculturist does not make full use of the veterinary dispensaries but he is gradually learning to do so. People in cities and urban areas make full use of them. The villager has no faith in the efficacy of the remedies and medicines and has a prejudice against them. He is unable, often, to detect the serious nature of the malady his cattle may be suffering from. He possesses often some indigenous remedies which are very effective. The veterinary man should try to gain the confidence of the villager rather than parade his knowlege and if he can demonstrate the usefulness of his department the prejudice is bound to be gradually removed.

(*d*) Any legislation is likely to deepen the prejudice and set the average agriculturist against the department and more effort is likely to be made to evade the law than to abide by it. Demonstrations, repeatedly given, and patience are the real remedies to contend against the existing prejudice. Any legislation is bound to make the department unpopular and mar its usefulness.

QUESTION 16—ANIMAL HUSBANDRY.—(i) In Berar, there is a great field for improving the cow and the bullock. The cow can be made to yield more milk than she does at present. I am informed that an attempt in this direction has been made in the Nagpur dairy farm and in the Punjab and what is known as the Montgomery bull has acquired a certain fame. Bullocks should be developed on two lines, *viz.*, working bullocks and trotting bullocks, the latter for travelling and racing. The heavy bullock that is useful in pulling the plough is not active and nimble enough to run on the road and, until the country tracks are so improved as to allow the use of other vehicles safely, a bullock cart is an absolute necessity for a long time to come in Berar, and, even after these kinds of bullocks have ceased to be a necessity people will want them by way of a luxury. Milch cows giving plenty of milk are a necessity and must be developed. I have observed the breed of the buffalo being improved in Poona in the dairy farm, and as the milk and butter from a buffalo is greatly in demand as a necessity of life in communities which do not consume flesh, the improvement of the buffalo demands immediate attention. The male buffalo is in great demand for work in paddy fields in the Central Provinces and thousands of them are imported from Marwar and other parts of the country.

(ii) The dairying industry needs encouragement and attention in India in general, and in Berar in particular. The vast majority of the population in Berar depend for their nourishment on milk and on its products and preparations, and it is essential, in the interest of public health, that a plentiful supply of these should be

available at cheap rates. A dairy was opened at Amraoti some time ago but did not prove a great success owing to various reasons. Chief among these were scarcity of fodder and the consequent high cost of good unadulterated milk. I suggest that a dairy should be opened for each district and if a persistent effort is made it is bound to be not only self-supporting but paying in the end. Anyway an experiment is worth trying and its need is urgent in Berar.

(*b*) (i) Common pastures are over-stocked and the cattle suffer terribly, especially in the hot season, both for want of water and fodder.

(ii) We have grass borders in tilled fields which yield grass in the rainy season and a part of the cold weather. But these are not at all sufficient and need to be supplemented by other means of maintaining the cattle.

(iv) There is absence of green fodders in dry seasons. Green fodder, however, can be made obtainable during the dry season by storing it in well built pits while it is green. I have seen fodder in its green state being preserved in pits made for that purpose. The fodder is pressed in a manner as to squeeze out all air and a layer of common salt spread over it and another layer of fodder is laid on it again, and so on till the pit is full, when it is closed up. When green fodder is needed the pit is opened, and though, usually, the uppermost part and edges of the stuff are spoiled on account of contact with earth, the rest of the bulk of the fodder is found intact and in eatable condition and the cattle consume it and are maintained in excellent health. If this is tried successfully on a large scale it may be possible to make the problem of fodder a little easier and a satisfactory solution may be hoped for.

(v) Salt is a great factor in animal food and I have seen cattle being given salt every day but the salt duty seems to have discouraged this practice and people can ill-afford it. Absence of mineral constituents in fodder and feeding stuffs has led to deterioration in the cattle.

(*c*) The scarcity of fodder is most marked in this district of Amraoti, and in Berar generally from the end of March to the middle of July if the rains are timely, *i.e.* when the monsoon comes on by the middle of June at the latest. If the rains delay the scarcity is prolonged in proportion. Young growing cattle begin to thrive in about four to six weeks after the scarcity ends.

(*d*) If the cultivator can be induced to reserve a part of his land for growing *juar* which may be stored green in the manner indicated above, in pits, and if he can forego the yield of the crop so as to save himself the expense of purchasing dear fodder at the time of scarcity, it may be possible to improve and supplement the fodder supply. Then again, if it be possible to grow thornless cactus which they tried in Madras on the estates of the Theosophical Society, it may prove a possible solution of the problem.

(*e*) Landowners may be induced to take a keener interest in these matters if it can be proved to their satisfaction that some practical scheme is possible which may save them the expense of purchasing dear fodder during the times of scarcity.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) I think the cultivator who knows his business and has a mind to go about it seriously is busy all the days of the year, roughly calculated. A man who owns more than a hundred acres of land may find more work than he can cope within a year. An average cultivator with an average holding of about 20 acres gets about 4 to 6 weeks time on his hands and I think it is a well earned rest, considering the hard work he is required to do and the poverty in which he is kept. In the slack season, if he can afford to do so, he takes rest and does not move out much under the hot sun. If he is so minded he occasionally goes out on a pilgrimage or visits his relatives. If he cannot afford to do so he goes out and works for others and earns enough to keep himself and his family alive.

(*b*) Rope-making, basket-making, making small toys for selling in fairs and other small industries that do not want much capital. The agriculturist does not generally look much beyond his own land.

(*c*) Bee-keeping is practically unknown so far as Berar is concerned. I do not know of any experiment having been tried, nor is it possible to say if it would be practicable. Poultry rearing is done by some farmers, but is done on a small scale and a scientific method of doing so would make the industry popular. The Berar agriculturist should be induced to consume eggs on a large scale as they form a good substitute for milk and its preparations, and will encourage the industry also. Fruit growing is tried in many places in Berar but the general experience is that it is not

paying in the end and the scarcity of water makes it still more difficult. I had a large garden at Amraoti in which fruit was grown but all the trees died in one year for want of water. An attempt was made to replace them and after the young trees were reared for a year, they also died on account of the same cause. The garden is practically desolate now. Expenditure on it is more likely to prove a dead loss than bring any return. If fruit is grown in the interior of the country where it is possible to have a reliable and sufficient supply of water it is very difficult to find a market for the fruit on any large scale, and in an attempt to bring it to the railway station for export to Bombay the fruit deteriorates and does not sell well. It is essential to have good roads which will allow of goods being carried cheaply and speedily to the nearest markets or to the railway stations for export. Unless these conveniences are made available the fruit growing industry will not prosper on a large scale. Lac culture was tried by me but I found that proper advice could not be obtained which might have led to success. It needs large trees and forest owned by the grower, which conditions are not available in the major part of Berar. It may be possible to encourage this industry on *ijara* lands in Yeotmal. I tried the experiment in my jungles in the Central Provinces in my malguzari villages. Rope-making and basket-making are tried by some people successfully. Of these I have known the agriculturists to make ropes but they do so to meet their own wants, and not on any extensive scale so as to turn the occupation into an industry. During his leisure time the agriculturist keeps himself busy and tries to meet his own wants, and, as he does not devote all the year to this, or such like industries, he cannot develop any of them to any large extent. There is a particular caste among the Hindus who are called *Burads* and who make baskets, brooms, mats and other similar things and they throve well till their baskets were gradually replaced by iron pots, and mats of bamboo were replaced by coir mats, both of foreign make. The *Burads* are dying out now and an attempt to revive them ought to be made which, if successful would do an immense good to agriculture.

(*d*) Yes. The Government ought to do more in that line than they are doing at present But they ought not to do so merely from the commercial point of view of returns, but by way of experiment and with a genuine desire to teach the industries to Indians and encourage them to start the same on their own account.

(*f*) India must be taught to make her own tools and use them, and not depend on other countries to manufacture tools for her. To study rural industries intensely with a view to introduce improved tools and appliances which presumably would be foreign would be working in the wrong direction, and would merely be encouraging Indian industries in order to find a market for foreign firms to sell their goods. That ought not to be so. If the Government is so minded, I believe it is possible to study rural industries with a view to getting the required tools made and manufactured in India and to establish the industries in such a manner as to make them permanent customers, of the Indian manufacturer. But unfortunately I have not yet seen any attempt made in this direction.

(*h*) The difficulty about this problem is how to make the village people understand what health conditions are. If they understand these conditions and also understand their effect on health they will certainly help in improving them. For instance, it is very difficult to make the villager understand the effect of dust on health, and even if he understands the same it is very difficult to keep the dust down in the village. Persistent propaganda must be made in this respect and there must be some place where prominent people from typical villages can be taken and ideal health conditions shown to them. It should be possible to make an ideal village where all health conditions are as near perfection as practicable and means must be devised to get other villagers to visit this village. A typical village which admits of improvements being made should be so improved, and, if possible, made a place of periodical fairs so as to get it visited by as many men as possible. Prominent men from villages should be taken out of their usual environment and kept for a time under more hygienic and healthy conditions for a short period, say 2 to 3 months, so as to make them appreciate the value of clean and healthy habits, and once they have done so they cannot but improve their surroundings after they go back to their villages. Mere advice and oral propaganda will not help very far. I have observed that men with unclean habits and used to unhealthy surroundings have changed their manner of life after living in towns for some time and improved the village surroundings after going back to the village. Only a few prominent men in the village need be induced to adopt a more healthy and clean mode of life; an attempt to approach every person in the village and to expect him to understand and appreciate lectures on hygiene and clean life is waste of energy and time to a large extent.

MR. B. G. KHAPARDE.

QUESTION 18.—AGRICULTURAL LABOUR.—(i) and (ii) Prospects of good wages and an easier life are the only inducements for tempting men to migrate permanently. Even then it is wrong to suppose that mere monetary prospects will induce a Berár labourer to leave his native place and migrate to another. The Berar villager attaches himself to his village and land and is reluctant to leave the same and it is not rare that he chooses to starve in his own village, where he has his relatives and friends, rather than leave his family surroundings and go to Karnatak or the Punjab, whatever the monetary prospects may be. If the labourer is given a share in the produce of the land on which he works he may be induced to migrate. Very often the Berar labourer likes to depend more on hope than on actual realities and if he is promised a share in the produce of the land on which he is called upon to work he may choose to leave his native place. In North India, labour is cheap and, very likely, it is so because the supply exceeds the demand and they migrate to Berar in search of work, but one rarely finds them working in the fields and helping the agriculturist.

Even if labour is brought from outside, the question of training them in handling agricultural implements remains unsolved, and unskilled labourers may do more harm than good.

I believe, in Berar, it would pay better to train the existing labour to work more efficiently and economically than to make an attempt to import labour for agriculture.

(ii) In tracts which are cultivable and remain uncultivated, it is practicable to induce men to go and settle on them and cultivate the land if the *ijara* system is introduced or some other system by which the cultivator will be guaranteed more money and advantages than are available in what is termed alienated or *khalsa* land. Areas that have remained uncultivated for a long time may have become malarious or dangerous on account of snakes or wild beasts and the risk the cultivator may be asked to run must be counterbalanced by equally weighty advantages before people are induced to bring them under the plough. If these tracts are measured, and charts of them are prepared and properly advertised, and proper terms are offered by the Government, it should not be difficult to bring them under cultivation. The fact that such tracts remain uncultivated for a long time is some indication of the fact that they cannot be brought under cultivation on the ordinary terms of the *khalsa* land.

(*b*) Shortage of labour was felt in Berar for some years past on account of the springing up of cotton ginning factories to which labour was attracted on account of the high rate of wage which a cultivator is unable to pay. The only remedies available seem to be (1) to import labour, if possible; (2) to train the existing labour and make it more efficient; (3) to pay the labourer higher wages and take more work out of him than he ordinarily does; and (4) to increase the hours of work.

The last mentioned item has great importance because the labourer works in the fields at present, not on the understanding of working for a certain number of hours, but he regulates his work by sunrise and sunset. The natural consequence is that the labourer works for a shorter time during the cold season than in the hot season, because the hours between sunrise and sunset are fewer in the cold weather than they are during the hot season. In the hot season the man invariably works longer than he does in the cold season while in fact the state of things ought to be just the reverse. Some measure must be adopted to induce the labourer to work by hour scale and if this can be done a certain amount of relief is bound to come to the agriculturist.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Agriculture must, by experiment, be shown to be as paying as other concerns, if not more so; the capitalist who likes quick returns and no risks cannot easily be induced to take to agriculture as a source of money making.

(*b*) The owners of agricultural lands feel no encouragement in carrying out improvements because they always apprehend that, in case they do so, the Government assessment will be enhanced in due time. The Government policy is to increase the assessment at any settlement. The recent policy as placed before the Berar Legislative Assembly by the then Revenue Member was to wipe out the "middleman" *i.e.*, the landholder. The note on 'Settlement' by Mr. Greenfield, the then Deputy Commissioner of Buldana, clearly contemplates the enhancement of the revenue up to 50 per cent of the cultivator's profits and he makes suggestions to that effect and recommends that an enhancement of revenue should be made up to 50 per cent instead

of 33 per cent and the period of settlement should be cut down to 20 years, instead of 30 years as at present. This policy and such recommendations are not calculated to encourage the cultivator to make improvements on his lands.

The income from agriculture is very uncertain in Berar as the agriculturist has to depend for his crops on the monsoons, and for the price of his goods on the fluctuations of the market which the Indian capitalist does not control.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) I think panchayat committees should be established and encouraged and a special officer should be deputed for the purpose by Government.

(*b*) Yes. The enquiry should be conducted by a committee in which the representatives of the people will have a majority. I suggest that District Councils should be asked to nominate one representative each on such committee. They should move from village to village all over Berar and observe the local conditions and make a report about the remedies they may have to suggest. The scope of the enquiry should be the steps to be adopted to improve sanitation in the rural areas.

Oral Evidence.

31869. *The Chairman*: Mr. Khaparde, you come from Amraoti?—Yes.

31870. We are greatly obliged to you for your note; would you like to make any general statement in amplification of it at this stage?—I would rather do so after I have been examined should it seem necessary.

31871. You are engaged in the practice of agriculture?—Yes. I lived on my land for a long time and I know a great deal about it. I have not been able to live on my land since I passed my law examination and started to practise as a pleader, but I have kept in close touch with it and supervised the work.

31872. When did you cease to manage the land itself?—About 1912.

31873. You say the public should not be taxed, either directly or indirectly, for carrying on research work. Do you think the practice of the whole civilised world in that respect is wrong?—No, but I think the kind of research work which is being done here is not of much use.

31874. That is a different matter. You do not mean the public should not be taxed either directly or indirectly for carrying on research work?—I mean the public in Berar should not be taxed for carrying on the sort of work that is being done at the moment.

31875. What wheats are you growing on your own land at the moment?—We grow cotton and *juar*, not wheat.

31876. What cotton do you grow?—*Buri* and *roseum*.

31877. What is the history of the latter? Was it recommended to you by the department?—Yes; that is why we grew it, but our experience is that although it gives a better yield than other seed it does not command a good price in the market, because it is not a long staple cotton. For a time the buyers wanted a short staple cotton because it was supposed to be useful for the manufacture of foreign cloth, but afterwards the price came down and now the demand is for long staple cotton, because Indians have now taken up the manufacture of cloth more than before.

31878. Are you going to cease growing *roseum* cotton?—If I can.

31879. You give your views on the various subjects you deal with very completely and I have very few questions to ask you. I should like to know what experience you have had of the working of co-operative societies?—I have not taken much interest in the societies we have in Berar. I know they lend money to the cultivators from time to time and that awards are often taken out against debtors without their being able to make arrangements for the payment of their debts. That is how some of the societies have come to be unpopular in Berar. Berar, however, has very prosperous co-operative societies, and, I think, is the only Province which can boast of having prosperous societies.

31880. But you yourself know very little about the details of their work?—That is so.

31881. Have you experience on your own estates of the indebtedness of cultivators ?—Yes.

31882. Is it a malguzari estate ?—Part of it is, and part of it is ryotwari.

31883. Do you or your representatives engage in money-lending at all ?—My brother does. We advance money to our tenants, and try to do so at a cheaper rate than other people charge, so as to make it as comfortable as possible for them.

31884. At what rate do you find you can make advances to them ?—I have been able to finance at 6 per cent, which is the lowest I can do it at, but I think it might be possible to do it at 5 or even 4 per cent.

31885. What is your average rate ?—6 per cent. It is almost all lent at that.

31886. Do you find the offer of cheap money encourages cultivators to overborrow ?—We take care not to give them more than they need, because we know them personally and we do not carry on an extensive business of that kind. We only lend to our tenants, and we know them and their requirements.

31887. It is a question of knowing the business of each man intimately ?—Yes, to a large extent.

31888. You are anxious that the opportunity to make implements in India should be taken advantage of. How do you account for the fact that Indian capital and Indian brains are not at this moment exploiting this field more energetically ?—I think they are. Kirloskar Brothers, for instance, have been doing their best to keep India supplied with their ploughs, and Berar has purchased very many of them; the Kirloskar plough is very popular there. Other people are perhaps not anxious to take it up because they are nervous about their chances of success.

31889. On page 406 you say, "If the Government is so minded, I believe it is possible to study rural industries with a view to get the required tools made and manufactured in India and to establish the industries in such a manner as to make them permanent customers of the Indian manufacturer." I do not quite see what Government can do there ?—Government can give subsidies, and make it possible for the railways to carry the goods more cheaply. Government can give concessions and *taccavi* loans. They have been rather shy of giving *taccavi* in Berar. Government can help the peasant in very many ways which I could mention. A fresh Commission might be appointed to go into the matter. When Government is minded to do a thing, it can always find means of doing it.

31890. *Mr. Calvert*: You say it would be worth while to try the experiment of applying the Usurious Loans Act. Is that Act not applied regularly here ?—No not in Berar.

31891. Is there any particular reason for that ?—No. The Act has not been applied; that is all.

31892. *Sir S. M. Chitnavis*: Have you the rule of *damdopat* there ?—Yes.

31893. How does it work ?—Fairly well.

31894. *Mr. Calvert*:—If the courts were so minded, they would find a way of applying the Usurious Loans Act ?—Not unless Government applies the Act to this Province.

31895. Does not the Act apply here ?—Not as far as I know.

31896. *Sir Ganga Ram*: What area of land do you possess ?—500 acres of land ryotwari and 1,500 acres malguzari.

31897. Did you take to law because you could not make a living out of it ?—No. I could make a living out of it, but I took a fancy to law and I wanted to make more money; one never has sufficient money.

31898. You have said Government should do a number of things. Do you think those things would be passed by the Legislative Council ? You are a member of the Council ?—Yes. I think the Council would vote for them, but even when the Council passes resolutions, Government is not bound to take action on them.

31899. *The Chairman.*—Do you wish to make any supplementary statement?—Yes. I wish to say in the first place that the agriculturist in Berar is working at a loss; he makes no profit at all. Secondly, in spite of that loss he continues to cultivate his land, because he has nothing else to do and does not know how else to maintain himself, and also from sentiment. Nothing useful can be done to help the agriculturist if the land revenue is not reduced. I believe the theory that Government and not the agriculturist owns the land is a most harmful one. That is the theory on which Government has been working, and we have fought against it as far as we can. We believe the State should not own the land; the land should be owned by the person who cultivates it.

(The witness withdrew.)

The Commission then adjourned till 10 *a. m. on Wednesday, the* 26*th January,* 1927.

Wednesday, January 26th, 1927.
NAGPUR.

PRESENT :

The MARQUESS OF LINLITHGOW, D. L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E. C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. C. U. WILLS, I.C.S.
SIR SHANKAR MADHO CHITNAVIS, KT., I.S.O. } (*Co-opted Members*).
Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH. } (*Joint Secretaries*).

Lieutenant-Colonel H. G. STILES WEBB, D.P.H., D.T.M. and H. (*Cantab*), I.M.S., Offg. Director of Public Health, Central Provinces.

Replies to the Questionnaire.

Question 1.—Research —I consider that research work should be undertaken in connection with diseases that are especially prevalent in rural areas and affect rural population. These diseases not only adversely affect the health but also the economic conditions of the agricultural worker.

The diseases I am particularly referring to are malaria, and helminthic affections, and possibly to a lesser extent small-pox, leprosy and tuberculosis.

Regarding helminthic affections, I am glad to state that apart from the work being done in the larger jails in the Province, a special enquiry is being carried out in the Nagpur district by Dr. Asa C. Chandler, hookworm research worker, who has been deputed for this work by the Director, Calcutta School of Tropical Medicine and Hygiene.

As submitted above, in order to improve the general health of the masses, includinig as it does very largely agricultural workers, it is absolutely essential to provide a Public Health Research Institute where the various problems affecting Public Health can be examined. This is the only Province in India where the Public Health Department endeavours to function without a laboratory of any sort, to do the very ordinary analytical work in connection with Public Health, to say nothing of experimental research in connection with special provincial epidemic diseases. This matter is however now being considered by Government.

Another matter that is specially essential as it particularly affects the agricultural population is the creation of a Malaria Bureau under a special Malaria Officer.

Proposals have been submitted to Government regarding this by the Public Health Department.

As things stand at present, the Director of Public Health is endeavouring to act as Chief Malaria Medical Officer and Chief Plague Medical Officer in addition to his ordinary duties.

This Province is shown in the latest map issued by the Malaria Bureau of India at Kasauli to be intensely malarious and so there is no need of mine to stress the necessity for the creation of such a Bureau.

LIEUT.-COL. H. G. STILES WEBB.

QUESTION 25.—WELFARE OF RURAL POPULATION.—I append two statements* showing the birth and death rates in rural and urban areas for the last twentyfive years. From these statements it will be seen that in rural areas the death rate is generally lower than that in towns, indicating that rural tracts are healthier than urban areas. This can be largely attributed to the open air life led by the people in the villages where little congestion of houses occurs and so the full benefits of sunlight and ventilation are obtained.

It has been recognised that in rural areas the chief obstacle to sanitary progress is the ignorance of the people about sanitary matters. The villagers do not understand sanitary principles and so view with suspicion any measures they are asked to adopt. The habits and caste prejudices of the people also retard progress.

In order to get rid of the ignorance and prejudices of the people it is of the utmost importance to impart knowledge on health subjects and the prevention of epidemic disease by giving illustrated lectures and distributing leaflets describing these.

2. The following steps have been taken by the Public Health Department:—

(1) Lectures in villages by Assistant Medical Officers in charge of epidemic dispensaries.

These dispensaries have been started mainly for the purpose of educating the people. The duties of the officers in charge are both medical as well as sanitary with the idea that they may gain the confidence of the people and disseminate knowledge concerning health subjects. These dispensaries are under the Public Health Department and work directly under the Civil Surgeons. They tour throughout the districts and carry on health propaganda work by lecturing to the villagers on epidemic diseases and other health subjects and by exhibiting the various illustrated charts supplied from this office.

(2) The appointment of two Health Publicity Officers who give lectures with lantern demonstrations at all large gatherings, such as fairs, etc.

(3) A course of hygiene is included in the curriculum at the training schools for teachers.

(4) The issue of leaflets in vernacular to schoolmasters and others dealing with epidemic diseases.

During the late War all the officers that were sanctioned in pre-war days for the department were withdrawn and none of these appointments have since been filled in. Hence the department has been working with a limited staff consisting only of the Director of Public Health and the 29 Assistant Medical Officers on epidemic duty. Recently two Health Publicity Officers have been added to the staff. Propaganda work has recently been started and like education, is always a matter of slow progress, and it will probably take time before any visible effects in the improvement of the public health can be expected. The following steps have been taken to improve health condition in villages:—

(1) Improvement of water-supply in rural areas and also at places where fairs are held, and along the routes leading to them, and also in ryotwari villages.
(2) The extension of the Village Sanitation Act to larger villages proceeds year by year.
(3) Travelling dispensary system as mentioned above.
(4) Vaccinators are trained in hygiene and epidemiology and so they are available for epidemic work in their circles when called upon.
(5) A Central Depot (Vaccine Institute) has been started at Nagpur where lymph for vaccination is prepared from carefully selected animals, purified and standardised by modern methods under skilled supervision and issued to the vaccinators in the whole Province.
(6) Medical inspection of schools by Assistant Medical Officers attached to epidemic dispensaries.

In order that the general health of the people may receive reasonable recognition it is necessary that it should be dealt with on adequate lines and the following represent the more urgent needs of the Public Health Department.

(1) Appointments of District Health Officers in large districts. In large districts the Civil Surgeon is in theory the Health Officer of the district. His duties

* Not printed.

LIEUT.-COL. H. G. STILES WEBB.

at headquarters, however, do not allow him to tour and inspect in the district to the extent that is necessary. The best and most hopeful method for promoting rural sanitation is the appointment of a whole time District Health Officer who would control and organise all the sanitary arrangements in the district.

(2) Increase in the number of epidemic dispensaries so as to provide one for each tahsil. The area over which the operations of each dispensary extend is much too big for one Assistant Medical Officer, and further expansion is therefore desirable.

In conclusion, the two most urgent needs for improving hygiene in rural areas would appear to be—

(1) The provision of District Health Officers.

(2) An increase in the number of travelling dispensaries.

Oral Evidence.

31900. *The Chairman*: Col. Stiles Webb, you are Officiating Director of Public Health in the Central Provinces?—Yes.

31901. What is the significance of the term "officiating" there?—It is one of those things in India by which, although my predecessor has definitely retired from the service, I have got to officiate for two years and four months until he is officially extinct as far as India is concerned; it is under the orders of the Indian Government.

31902. Has it some association, remote or otherwise, with your salary during those two years?—Yes, it has considerably.

31903. You have provided the Commission with a note of the evidence which you wish to set before us. Would you like to make any statement at this stage?—There is one thing with regard to agriculture in this Province and that is the health of the agriculturists; in this Province their physique is exceedingly low and their height is small. A fortnight ago one of the scientific papers published information regarding the relative heights in the various Provinces in India. If we can give the agriculturist of this Province good health, we may be able to do something towards agriculture. Physically and mentally he is a bit weak.

31904. Would you give the Commission shortly an account of the organisation of your service in the Province?—The Public Health Department, I believe (I am speaking off-hand) was started in or about the year 1910 and they had then a complete staff or which became so very shortly afterwards; they had a Director of Public Health and an Assistant Director of Public Health in 1909, a Chief Plague Medical Officer from 1912 onwards and shortly afterwards they had an officer on special duty with regard to malaria. So there was more or less a complete staff. But since the War on account of financial stringency there has been only the Director of Public Health. We have no special officers working on any of the special diseases, or doing any research work, and this is the only Province in India in which such a state of things exists, where there is no laboratory where we can work out the various problems that confront us. The organisation itself is fairly complete, with the exception that we are understaffed, and we have this great handicap in not having a place where we can do any practical work to solve the various problems such as we meet in this Province. We have, for instance, leprosy, malaria, hookworm, tick typhus (which is prevalent in the Balaghat district and in the Saugor district). All these problems require elucidation; but there is not only no staff, but also no means of setting about the solving of the problems.

31905. I want to be quite clear about this question of facilities. *Is it really* the case that you have no laboratories here?—I have no laboratories at my disposal; none. There is a small laboratory attached to the Vaccine Institute which is for dealing with the purity of the vaccine lymph supplied, but beyond that there is nothing whatever; and we do no bacteriological work at all. The water samples of this Province have to be sent to Bombay, Calcutta or Agra and that means in the hot weather it is impossible to send the water down in time and so the required examination invariably goes wrong.

31906. If you have a case of typhoid, have you any means to have the smear examined?—I have none at all. The proper way is to take the blood at a certain period of the disease for the actual cultivation of the organism and to put the serum up against a known strain of the organism concerned, but I have no means of doing either.

31907. To come now to your organisation in the districts: In the provincial memorandum entitled the *Memorandum on Rural Conditions and Agricultural Development in the Central Provinces and Berar*, paragraph 31, page 15, it is stated that 29 dispensaries have been started mainly for the purpose of educating the people. Who is in charge to-day of those dispensaries?—These dispensaries, now 30 in number, are in charge of what we call Assistant Medical Officers, equivalent to Sub-Assistant Surgeons in other Provinces and they work indirectly under me. The whole "organisation" is under me, but they work immediately under the Civil Surgeons in the districts to which they are posted.

31908. You say there are 30 now. These dispensaries are all peripatetic, are they?—They really are. What it amounts to really is the old plague staff camouflaged

31909. They represent the only medical organisation in the rural areas, I suppose?—We have two Health Publicity Officers who go about touring with magic lanterns and giving lectures. During the big fairs, Health and Baby weeks, and whenever they have an agricultural show, we generally send one down because a lot of people are collected there and he gives 3 or 4 lectures there.

31910. Have the local authorities any medical organisation at all?—No. There is no District Health Officer in any part of this Province; that is one of the things which is very necessary. The Civil Surgeon is supposed to be the District Health Officer in his district but it is impossible for him to do all the work.

31911. In the event of an epidemic outbreak of a disease, what medical forces have you available for mobilisation in that particular district?—I send down one or two or three epidemic dispensaries if necessary and I invariably go myself. If the Civil Surgeon wants more help, in the first place he applies to the Inspector-General of Civil Hospitals for it.

31912. Are you attempting to extend the knowledge and skill of your vaccinators?—Yes; we are not only training them but we are insisting on certain educational qualifications, and the men whom we train are generally not more than 20 or 22 years of age. We are also teaching them epidemiology. There is a Vaccine Institute and last year we started training schoolmasters in the technique of vaccination and I think it is going to be a success. They can vaccinate within about 5 miles of their school and in one case I know a man earned Rs. 90 in three months.

31913. Can these vaccinators deal at all with a case of cholera?—No, they do things like permanganating the wells, but the actual treatment is done by the epidemic staff.

31914. They are the only people who are capable of giving the salt injection?—We hope they are capable; sometimes their treatment is rather empirical.

31915. On the question of malaria which you mentioned a moment or two ago, is there an organisation to deal with malaria in this Province?—No; there was a survey made in 1912; since then no work has been done regarding malaria. This year the Forest Department asked me for the services of an epidemic dispensary and I got Government to establish one. It is at present working in Melghat; we had also sent graduate for training in malariology at Saharanpur.

31916. As regards the distribution of quinine, I take it that you have any organisation?—Yes; it is done by Tahsildars and others.

31917. Are you satisfied with that?—Yes, as far as it goes. We spend about Rs. 50,000 a year in distributing the quinine to the people. It would however be very much better to carry out malaria surveys in certain selected areas, which might cost 2 or 3 lakhs, and in this way try to eradicate the disease. I am speaking from my experience in the Punjab and I think it would be money well spent.

31918. From your knowledge of the operations in the Punjab and from your acquaintance with the conditions in this Province, do you think that a campaign might be successful there?—Yes, in certain parts. I have been only 20 months in this Province. I think it might be difficult. I am thinking of the Melghat and other places; and I am going there next month to have a look and I anticipate something can be done locally quite easily and quite inexpensively.

31919. From the records at your disposal, do you regard the population of this Province as widely infected with malaria?—Yes, I should say it is. In the latest

map which was published by the Central Malarial Bureau they colour us very dark for malaria. The Melghat district and certain parts of Chhattisgarh and Raipur are the worst.

31920. Is any work being done on the hookworm disease in this Province?—There is a certain amount of work being done in the larger jails. Convicts are examined for the presence of the hookworm and a record is kept; the last record that I had made showed that 25 per cent of the jail population were affected with ankylostomiasis and 16 per cent with roundworm, which is very high. The significance of the roundworm is a thing which is not generally recognised but itgives rise to some deaths; I have seen one or two cases. A certain number of people get affected with roundworm and it is not recognised till the case is on the operating table. There was a case of a boy recently in Raipur. The Civil Surgeon examined him and kept the case under observation; he subsequently opened him up and removed 80 roundworms. I think it is a thing which we shall have to seriously take up in this Province.

31921. *Sir Henry Lawrence*: How does it come?—I think it is a good deal due to the water. It occurs in most of the water-supplies, say in the tank water-supplies of Raipur and Bhandara; or, where they take water from a river bed in which water melons are grown under heavy manuring; that is a great breeding place.

31922. *The Chairman*: Is that a disease common to man and beast?—Probably the man is the intermediate host and the beast is the real host.

31923. But it appears in man and beast in the same shape?—Yes.

31924. On that point, do you regard the interconnection between your Service and the Veterinary Service as important in its relation to public health?—Certainly, it is very important. I think I am right in saying that they are similarly situated to what I am, having no place for research work. I know a proposal was put up by them that we should have a joint laboratory, which I welcomed.

31925. Your think there might be a workable arrangement?—I think so, yes.

31926. You think the relation between the veterinary activities generally and the health of man has been sufficiently worked out in this country?—It has been worked at but what one knows of chiefly is tuberculosis. Though tuberculosis in cattle in this country is not anything like so prevalent as in England, still it does exist and it is one of the important things.

31927. Is there a Rockefeller investigator at work on hookworm in this Province?—No; there is no work of any description being carried out in this Province.

31928. Still, in the provincial memorandum, paragraph 37, page 16, you say: "Considerable sums have been spent by the various bodies concerned in the improvement of rural water-supply." You give there a list of the demands that have been made to improve the local water-supply and the money spent thereon. Has much been achieved by these efforts?—In the larger towns, yes: the amount that is spent on rural water-supply is very small; it is Rs. 10,000 this year for Berar.

31929. Do you think that the statistics of disease and death show an improvement as a result of the improvement in the water-supplies?—Yes, in some places; for instance in Damoh they have got a very decent water-supply.

31930. Have you worked out the expense of improving the drinking in water-supplies?—I should think that it would be next door to impossible, because many places in Berar it is not a question of improving it; it is the only water-supply. That is one of the problems there.

31931. Is it usually well or tank?—Nearly always well.

31932. Is not the construction of the well-head very important?—Yes.

31933. Is that a direction in which improvement might be done?—Yes; as a matter of fact that is being done, throughout the whole Province wherever possible.

31934. What is it costing?—I could not tell you off-hand.

31935. Would you look that up and let us know?—I cannot tell you what is being spent.

31936. Have you any idea how much it costs in the case of the average villager to put his drinking water-supply into reasonably good order?—I could not tell you.

31937. Is there a great deal still to be done in the Province in improving well-heads?—Yes, particularly in rural areas. It is reported by the epidemiological staff hat such and such a well is not protected and we take steps in the matter.

31938. Are you within sight of achieving your aim, do you think?—I think so; a considerable improvement has been brought about especially during the last few years with regard to water-supplies.

31939. Do you think that the results are reassuring?—Yes. Take the infantile mortality which is the best thing to use as a guage for general sanitation. During the last five years it has come down considerably below 200, whereas in any other preceding period of five years it has never fallen below that figure.

31940. *Sir Ganga Ram*: What is this figure of 200?—200 per thousand living.

31941. *Prof. Gangulee*: Do you disinfect wells in case of epidemics?—It depends on what the epidemic is. If we are up against cholera for instance, which is the main disease here, we use permanganate of potash, which is the cheapest and most easily obtainable disinfectant.

31942. Do you find any protests in the villages in using that water?—Not if you go yourself.

31943. *The Chairman*: I think you misunderstood the question I put you some moments ago as to whether research work was being done under the *aegis* of the Rockfeller Institute. I see here on page 411 of your note that you say that a special inquiry is being carried out in the Nagpur district by Dr. Chandler, the hookworm research worker?—That is rather with regard to the relation of the soil to disease. He sent two or three people down here who were working in that direction and then he came down himself to see the results. I met him at Jubbulpore and we found that the hookworm ova do not thrive in certain soils, particularly the black cotton soil, in this Province. That was the nature of the inquiry.

31944. Is this inquiry still being carried on?—No; at present nothing is being done.

31945. Would you turn to page 412 of your note?—You say: "It has been recognised that in rural areas the chief obstacle to sanitary progress is the ignorance of the people about sanitary matters." If you were asked for the ideal facilities for latrines for a village, what would be your advice?—The ideal is a water carriage system, which of course is out of the question.

31946. But within the region of practical politics, what would be the system?—I think the system which they should utilise should be the one which is in practice in some parts of the North-West Province where they have got to go a certain distance from the town and not go all over the place.

31947. Do they dig a trench?—I think the sun generally does what is necessary.

31948. It is an important point, is it not? For instance, the infection in hookworm is conveyed directly from waste products to the foot, and supposing you do have a place set apart for that purpose, unless you have a trench you are still going to get the infection, are you not?—Yes, that possibility is incurred, but how are you going to enforce it? You can only give them a lecture on hookworm and make certain suggestions.

31949. I only wanted to discover what your ideal was?—As I said, the water carriage system is my ideal.

31950. You say, provided the sun is allowed to get at the night-soil it is more or less disinfected and sterilized? Is that the case in hookworm?—Yes, provided they do not get into the soil. As I say, the black cotton soil is not a suitable soil for them to develop in.

31951. Are you using the primary school system in this Province to teach health rules?—Yes, lectures are given in primary schools on hygiene, and there are primers.

31952. Have you yourself seen these primers or attended these lectures?—They are all in the vernacular.

31953. Have you had them translated or seen the primers yourself?—Not the actual primer; but we have issued a primer ourselves, which is widely distributed.

31954. One gets the impression that the population are capable of being taught these matters; for instance, they now understand the business of dealing with plague conditions. They are ready to leave the towns and camp out at a moment's notice?—Yes, at certain times of the year.

31955. No doubt in the rains it is not done quite so easily. But they are no doubt capable of being taught, are they not?—Certainly.

31956. Would you like to see a Public Health Act passed for this Province?—Yes, I think I should. But the most important thing at present from our point of view is the question of getting some sort of a Registration Act. The only data that we have got to go on to see that we are doing any good are the vital statistics, and vital statistics gathered from present means of registration of vital occurrences is a very difficult business. The Act of 1886 was purely a voluntary Act which I do not think was really very sound, because each Province was allowed to work it as they liked. There should in my opinion be uniformity for the whole of British India and then we should be able to correlate results with those of other Provinces and see how things are progressing.

31957. Have you considered as to whether there should be an All-India Health Act or whether it is to be done Province by Province?—I think it ought to be an All-India Health Act. I am speaking of British India of course.

31958. *Prof. Gangulee*: Your idea is to get uniformity of results?—Yes. For instance, the infantile mortality of this Province is higher than that of any other Province, but the conditions here are much the same as in certain other Provinces and yet we have a higher infantile mortality. Something might be done in that direction to see why the figures vary in two Provinces where the conditions are about the same.

31959. *The Chairman*: Have you studied the problem of rural health as it is affected by nutrition?—I do not know much about deficiency diseases and I have not really studied the dietary of this Province; and any evidence that I might offer is hardly worth recording.

31960. Have you had time yet to form any view as to whether there is any correlation between the diet of particular districts and the physique and health in those districts as compared with others?—No, I should not care to hazard an opinion.

31961. *Mr. Calvert*: The Punjab diet and the Central Provinces diet are not quite the same?—You have only got to look at the people of the Punjab; they are bigger made, and weigh more. Their diet is of a different quality.

31962. *The Chairman*: But you have got different races?—Yes. Look at the Chhattisgarhi Gond people who are very much bigger and heavier than the people of any other part of this Province; and so far as I can see the diet is rather the same.

31963. Do you think the Chhattisgarh men are better nourished?—Yes.

31964. And they are a rice eating population, are they not?—Yes.

31965. *Sir Henry Lawrence*: Are they better nourished than the Beraris?—Yes, the Chhattisgarhi Gond is more equivalent to the Gurkha; he is a big thick-set fellow.

31966. *The Chairman*: After all race remains a very important thing. You may feed a thoroughbred forever, but you cannot build it into a Clydesdale, can you?—No.

31967. *Sir Henry Lawrence*: Did I understand you to say that you deprecated expenditure on quinine? You would prefer something to attack the causes of malaria?—Yes. It seems to me that if we could spend two or three lakhs to clear up malaria in one or two of our worst areas it would be a better way of spending money than by allotting Rs. 50,000 a year in what I consider to be a haphazard way where you are really not touching the cause of the disease and you are certainly not eradicating it.

31968. Do you find support for that view amongst other authorities in public health?—Yes. At the Research Workers' Conference in Calcutta, which I had the

privilege of attending, that was one of the things that were taken up, the creation of an All-India Malaria Bureau, and thereby really trying to do some organised work in the whole of India. I applied here for the institution of a Malaria Bureau.

31969. Would you stop the distribution of quinine to school children?—If you mean for prophylactic purposes, then I am not at all a believer in prophylactical quinine. In my opinion, it only tends to mask infection and you carry the germ with you and infect other perfectly healthy people.

31970. Was any resolution passed at this meeting of research workers to which you have referred?—Yes. A resolution was passed that there should be some central organisation, and they are going to start it at a place called Karnal in the Punjab, where they have a laboratory.

31971. Could you refer us to the record of that discussion?—No, because it has not been published yet. That was one of the resolutions, but I have not got any copy of it.

31972. But it will be published?—Yes. I have not received a copy.

31973. *Prof. Gangulee*: When was the conference held?—From the 13th to the 16th of December 1926, at Calcutta.

31974. *Sir Henry Lawrence*: Do you make any use of the population collected in jails for teaching simple hygiene?—Yes. We give lectures in the central jails. I think the Health Publicity Officers go down and give lectures, and they appreciate them apparently.

31975. Do you suppose that any considerable proportion of the jail population are enlightened in this way?—I should hardly like to express an opinion. I do not know whether in this Province they go from jail to jail, but I rather fancy that most of the men in the jails are habituals, and no sooner are they sent out than they are in again. It is rather difficult to say.

31976. Are these lectures given in every jail or only in the central jails?—It has been done in the central jails in Nagpur and Jubbulpore; I do not think it has been done in Raipur. It was done as an experiment last year.

31977. It is only just started?—Yes.

31978. Do the jail authorities welcome this movement?—Yes.

31979. It might be a very important medium for the enlightenment of the population?—It certainly would be an accessory, but not so much, I think, in central jails as in the district jails.

31980. Has that been touched?—Not yet. There are difficulties in lecturing in a jail. I do not know whether they allow all the criminals to come together, the males and females, etc. It has been done in the central jail. We have tried it with a magic antern, and they like that.

31981. So far, it has only been done with a very small percentage of the jail population?—Yes.

31982. What is your jail population in this Province?—I could not tell you most of the jails are mostly empty. I think only 50 per cent of the accommodation is utilised.

31983. If you take all India, I gather that there are about 700,000 inmates of jails. The Public Health Department could make full use of that material?—If you take the North-West Frontier Province, I can guarantee you a full house; all the jails there are over flowing.

31984. Has this experiment been tried in other Provinces?—I do not know.

31985. Would you recommend that it should be done?—I think it might be done.

31986. *Sir Ganga Ram*: Is there much leprosy in this Province?—I should say that this Province has more leprosy that any other part of India.

31987. What measures do you take to prevent the spread of leprosy? Have you any special institutions here to keep them?—Yes, there are eight institutions at the

present moment (I like the word institution and not asylum) which are run by Missionaries. We are going to open leprosy dispensaries at five of the biggest towns where leprosy is prevalent, for instance in Raipur, Amraoti and such places.

31988. Are you of opinion that it spreads by the touch? Some doctors are not of that opinion?—It spreads by intimate personal contact. Beyond that I cannot tell you; it is unknown yet how the disease is actually transmitted.

31989. Three years ago, during Lord Reading's time, there was a large collection of funds to combat leprosy. What share of that fund did you get?—We collected for that fund a very large amount, namely, over Rs. 2 lakhs. That money has gone to Delhi to the Viceroy's Endowment Fund, but up to the present time we have not got anything.

31990. Are you aware what they are doing in that respect?—They are spending money on getting another research worker and on propaganda work, and they are paying for the training of medical personnel in the treatment of leprosy. Last year there were 15 medical men from the whole of India trained for treatment of leprosy. 7 or 8 went from this Province, and since then 4 have been trained from my department and 4 have been sent by the Inspector-General of Civil Hospitals; we are also sending 5 men next month to Dr. Muir in Calcutta for training.

31991. Is the treatment of leprosy that you give that of Dr. Rogers?—It is the Hydro-carpus oil-cum-creosote treatment.

31992. Is that the final treatment which has been fixed upon?—That is what we propose to utilise in this Province. We have not got facilities for trying a lot of treatments, such as the treatment by the modified tuberculin of Dr. Row of Bombay. There is another treatment, namely, what is known as Hg. 33. It is a preparation of mercury and arsenic, and the idea is that it will simultaneously cure syphilis which is prevalent among lepers, because until you combat the syphilis in the leper you can make very little impression on his leprosy. This drug will tackle the two at the same time.

31993. In this Province, you do not allow the lepers to spread about and to go on begging and spread the infection? Are they restricted in any way?—The Leper Act can be applied in any district in which the Deputy Commissioner asks for it to be applied. Personally, I am very much against compulsion because by compulsion we shall defeat our own object. Another thing is that most of the begging lepers are not infective. They do not spread the disease, they simply linger on. It is the man who does not know that he has got leprosy that is the real source of infection. It is in the primary and secondary stages that leprosy is infective. They found a man in Calcutta who was preparing sweets who was suffering from leprosy; he would be likely to spread the infection, because he did not know that he had leprosy.

31994. *Sir Henry Lawrence*: Can you suggest what is the leper population of the Province?—I think it is 10,000.

31995. The Census Report says that it is about 13,000?—Yes. I think we have 7,000 in institutions. That is rather a floating figure, because they come and go; there is no compulsion.

31996. *Sir Ganga Ram*: Are not these Missionary institutions helped by the central endowment fund?—Yes. This Government has been paying a subsidy. Now it is a capitation grant for the food and the upkeep of the lepers. We also give them very large grants for new buildings and any sanitary measures like new wells and water-supply. It does not, for some reason or other, come through my department, although I handle a good deal of it because it is an epidemic disease.

31997. You have not got any leper settlements where the inmates can be trained in agriculture?—No, but there is a suggestion to take a place a few miles from Raipur and put up a Government institution there, but I think we shall have to wait a bit till we get more in touch with them, possibly by means of out-patients at the special leprosy dispensaries.

31998. You say that money should be spent on eradicating malaria?—I think so.

31999. Do you mean according to the Ross system?—Every problem has its own solution. In some places, it may be better to tackle the mosquito and in others to tackle the reservoir of the disease.

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32000. Do you have a reliable system of registration of births and deaths?—I should say that it is exceedingly bad. It is done by people who get no extra pay for doing it, and consequently they do not care very much about it.

32001. There is no penalty attached to it?—No. There are sanitary byelaws but they are very rarely enforced.

32002. There is no means of preparing vaccines and making cultures in the laboratory here?—The only laboratory that I have is the Central Provinces Vaccine Institute, where we manufacture lymph for treating small-pox.

32003. You cannot make cultures for examination?—I have no laboratory staff.

32004. The Medical Department have one?—There is a laboratory attached to the Mayo Hospital in charge of an Assistant Medical Officer, at the present moment.

32005. Can you not get the work done there?—It does not come to me. They do not apply to me as they might, and as they do in other Provinces.

32006. You say that you allow vaccination to be done by schoolmasters. Is it safe?—Yes.

32007. You think they do not commit any mistakes?—All these men, before we allow them to vaccinate, are trained for six months in the Vaccine Institute; they also train them in epidemiology. They are examined at the conclusion of the course.

32008. You allow them some fee?—I think it is 3 annas, but that is not my province.

32009. It is the recognised fee?—They have fixed this amount themselves as far as I know. I do not know whether the Education Department has fixed it. I am only told that is the fee.

32010. Do you not think that water diseases occur more in paddy growing areas?—Are you speaking of malaria and cholera?

32011. All sorts of diseases, roundworm, hookworm, etc.?—The more the water the greater the probability of water-borne diseases, particularly cholera.

32012. Do you see that some text-books are introduced into schools for hygiene?—There is merely a sort of little series of lectures on just the elementary things.

32013. Do they not consult as to what is being done in other Provinces in these matters?—I suppose they do.

32014. Is it not part of your duty to see to these hygiene lectures?—They generally apply to me, and we just draft them out for them. You asked a question about consulting other Provinces. That is one of the things from the absence of which the whole of the Public Health Departments of India are suffering. In 1913 they commenced holding what were known as Sanitary Conferences where the Directors of Public Health and other Sanitarians and Epidemiologists used to meet and discuss problems and exchange views, but there is no such thing now.

32015. *Prof. Gangulee:* Has it been discontinued?—Yes. It is very important that there should be such an All-India conference.

32016. *Sir Ganga Ram:* Is there not a weekly or monthly Government publication in which the results of researches into medical science and hygiene are reported and which reports as to what is done in the various Provinces?—Not in any one Province.

32017. Is there not an All-India publication?—There is the Indian Research Association and they publish their journal about 3 or 4 times a year, but that is devoted to research work and not to public health work. Of course the one is a corollary to the other to a certain extent, but public health work is somewhat different. Unless we meet together and know what the other people are thinking and doing, we are much handicapped and at present we have no such opportunity. For instance, with regard to plague measures, we wanted to know what is considered to be the standard of rat destruction in other Provinces. We held a meeting in Calcutta to talk over these things, but you cannot discuss a big subject, like plague, in two hours.

32018. Is there a public health journal for the whole of India?—There is none now.

32019. Would you recommend something of that sort?—I think it would be a very good thing.

32020. What part of the Punjab were you in?—I was Deputy Sanitary Commissioner at Lahore, and afterwards Chief Malaria Medical Officer.

32021. *Sir Thomas Middleton*: From the figures * you have given us it would seem that fevers are much worse in rural than in urban areas?—Yes.

32022. In the last seven years the death rate in rural areas was something like 20 per thousand while in the towns it was about 13 per thousand?—Yes.

32022. I suppose diagnosis in the towns is much better than in rural areas?—The facilities for diagnosis are better.

32024. Is not the work better done in the towns than in rural districts?—Possibly, because in some parts of the Province there are people who have never even heard of modern methods of treatment and who continue to use their own remedies. With regard to malaria in urban and rural areas, if you work in a malarious district you will find all round the town the population has a greater splenic and parasitic index but as you get towards the centre of the town you will find it considerably diminished. That is perhaps the answer to your question.

32025. That explains why the percentage of deaths in rural areas is much higher than in urban areas?—That is possibly the explanation, yes.

32026. What I want to get from you is whether the figures 20 and 13 represent the kind of figures you would expect from your general experience, or whether there is a large margin of error?—There is a very large margin of error.

32027. In looking at any of these figures we must expect a large margin of error?—Yes. The very first day I came to this Province I saw a Hindi word put down as the cause of a certain number of deaths, and on inquiring what it was, I was told it was worms. I did not think of the significance of it at the time, but that was possibly roundworm. Deaths are commonly attributed to worms in certain parts of this Province.

32028. I took fevers as an example, because that is a case where there is a wide difference in mortality as between town and country, and I wanted to ascertain whether these figures represented some real difference or whether they were due to errors in the classification of disease. Your view is that they represent a real difference?—Yes.

32029. You have commented on the physique of the people in the Chhattisgarh Division and in the Berar districts, and I think your view is that the former are stronger and healthier than the latter?—They are more strongly built, certainly.

32030. Can you tell us about any other Divisions of the Province, such as the wheat-growing tracts in the north?—I am afraid I have not been here long enough to give an opinion. As far as I can see, the Chhattisgarh people have the best physique, but I am not prepared to say they have less disease.

32031. *Dr. Hyder*: In reply to a question by the Chairman, you said you had no facilities for investigation?—Yes.

32032. Have you any facilities for the prevention of disease?—One is a corollary of the other; you cannot prevent disease until you have discovered the cause.

32033. Have you any facilities for the education of the people generally?—Yes, we have Health Publicity Officers who go round and attend all fairs, shows, etc., and give magic-lantern lectures which are very popular. We also do work in the schools.

*Statement showing deaths from different causes and births during 1901 to 1925 in (1) the rural districts and (2) in the towns of the Central Provinces and Berar.—Not printed.

32034. Would you like to have a Public Health Research Institute for the Central Provinces?—I rather deprecate the word "research". I want a Public Health Institute in which we can make preliminary investigations, the research itself being conducted by a central body. There is no need for a multiplicity of research institutes in India; for one thing, we have not the staff. There should, however, be some institute where preliminary investigations could be made, and then the results would be put up to the central body which would go ahead and work on them if it thought fit.

32035. What is the total population entrusted to your care?—14½ millions.

32036. Do you know the kind of work that is being carried out on malaria in the Federated Malay States?—I have heard of it.

32037. They do not have to look after more than 1½ million people, but they possess all these facilities for the investigation of disease and its prevention and cure, and also for educational work. You have nothing of that kind here?—We have nothing like that in this Province, but the problem in India is different; political factors have to be taken into consideration, especially in this Province.

32038. Is there any arrangement for interchange of ideas and associated effort between the Medical Department, the Public Works Department, the Engineering Branch of the Railways, the Irrigation Department and so on in this Province?—Yes. In the Public Health Report for the year we embody the work where we overlap. There is no Sanitary Engineer in this Province, and we need one. In the Public Health Department of the United Provinces there is a staff of Sanitary Engineers working under the Director of Public Health.

32039. Have you any say in the matter of irrigation reservoirs in this Province?—No. If they were undertaking extensive irrigation works, I should go and see that what was being done was all right from the health point of view. If an area is properly irrigated there may be, as in the case of the Montgomery district in the Punjab, less malaria than before.

32040. Have you any arrangements for ascertaining the spleen index of school children?—It used to be done, but it has fallen into abeyance in this Province for lack of staff. I have personally made a few investigations, but I have not sufficient data on which to found an opinion. There is no doubt that in certain parts of the Province the prevalence of big spleens amougst the children is more noticeable than in others.

32041. *Mr. Wills*: Have you ever heard of any increase in malaria in Chhattisgarh as a result of irrigation?—No.

32042. Or of any increase in any other disease?—No.

32043. You were not here in 1918, but do you happen to know the mortality figures from influenza in that year?—I think the mortality was something like 1 in 10; 105 per thousand. It was, as usual, greater than in any other Province. Only in one year were we beaten in that respect, and that was in 1917, when the Punjab had the highest infantile mortality rate in the whole of India. We have been first, unfortunately, ever since. The percentage of children dying in the first year of infancy has been and is higher here, than in any other Province, except during 1917.

32044. *The Raja of Parlakimedi*: What are the most virulent diseases in this Province?—As far as the rural population is concerned, cholera, plague, malaria and (in certain parts only) leprosy. Tuberculosis is undoubtedly spreading in this Province also.

32045. *Prof. Gangulee*: What about venereal diseases?—I am told they are very rife in Chhattisgarh and the eastern parts of the Province, and Missionaries at Mungali are making a special effort to deal with it. The Red Cross gave them a grant to buy salvarsan last year, and I am trying to get them a grant this year.

32046. *The Raja of Parlakimedi*: Which of the diseases you have mentioned is the most troublesome?—It varies from year to year. Last year we had a good deal of cholera in the eastern part of the Province, and this year plague has been troublesome, and also small-pox in Berar, where the people will not be vaccinated. It may be the people do not object so much to vaccination as to the vaccinators; I cannot say. The personal factor has always to be considered in India.

32047. I suppose these diseases depend largely on the season?—Yes, on the season, the climate and the rainfall.

32048. With regard to the appointment of Health Officers, application has first to be received from the District or Local Board?—There are only three Health Officers in the whole of the Province at the present time: at Jubbulpore, Nagpur and Amraoti. There are no District Health Officers in any part of the Province.

32049. You have not received any applications from Local Boards?—No.

32050. Were the three officers you mention appointed by Government?—The appointment is left to local bodies, but the final say in the matter is with the Director of Public Health. Naturally, as far as is advisable, I let them have their choice, because they pay half his salary (Government pays the other half) and they may prefer one man to another.

32051. What is the extent of the jurisdiction of these three officers?—Only within the boundaries of their Municipalities. At one time I thought that, as Government paid half their salaries, they might be utilised in the districts; but I think the Municipalities might object. They have enough work to do in cleaning up places like Nagpur in any case.

32052. Have these Municipalities Sanitary Engineers?—They generally have men called Municipal Engineers, but I would not care to call them Sanitarians.

32053. Have any of them Sanitary Inspectors?—Yes. They are all trained in Bombay, and Government pays half their salaries.

32054. How many are they in number?—All the big towns practically have a Sanitary Inspector or two. There must be about 50 employed in the whole Province.

32055. Who supervises their work?—The Health Officer if he is there and the Civil Surgeon if there is no Health Officer.

32056. Is it at fixed periods, say, so many times per year?—He is supposed to supervise all the year round. The Sanitary Inspector works direct under the Health Officer.

32057. What are the things he is supposed to look after?—The Sanitary Inspector sees that the sanitary staff does its work properly, the removal of refuse excreta and such like things.

32058. Does he also see that the water sources are not contaminated and all that kind of work?—Yes.

32059. What attention does baby welfare receive in this Province?—We publish an account of all the Baby weeks, what they do and all the rest of it and this year we are making a special effort in dealing with it; only at present the control has been vested in a special committee of the Red Cross, although the grant is passed through my budget and I think they will be able to deal with it better in some ways. I am a sort of liaison officer between the general committee of the Red Cross and the Public Health Department and I am also a co-opted member on the special committee. There again you have got to leave a certain amount of latitude to local authorities in the matter of the way of conducting of their campaign.

32060. Do many Municipalities take interest in such things?—We had been rather badly handicapped by what is known as the Sim formula. Under this formula $\frac{5}{6}$ths of the amount is to be spent in the Central Provinces and $\frac{1}{6}$th in Berar. So unless you can get Berar to spend $\frac{5}{6}$ths you cannot get anything for the Central Provinces.

32061. *The Chairman*: Who was Mr. Sim?—Mr. Sim, of the Government of India, who has now joined Vickers. You cannot run disease according to formulae.

32062. *The Raja of Parlakimedi*: How many lady doctors are there in this Province?—You are taking me out of my department. I think there are about four or so who work practically on infantile mortality.

32063. Do each of these Local Boards and District Boards possess one?—No.

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32064. Not even one of them?—Some of them have. There are 4 or 5 throughout the Province. First of all you cannot get them. The female Assistant Medical Officer is exceedingly rare; you must remember the standard of education among women.

32065. So the treatment of women is practically ignored here?—No. Now there is a movement to establish female hospitals and it will do a tremendous lot of good, particularly in regard to infantile mortality, because you are not going to get much beneficial result from first starting welfare centres, washing babies and bribing *dais* to come and listen to lectures. Where you have maternal disease as the main cause of infantile mortality you are not going to deal with that except through the foundation of women's hospitals.

32066. Where are these hospitals going to be built? One is going to be built at Chhindwara. Of course there are female hospitals under the Dufferin Fund in all the big cities.

32067. How many such hospitals are there in this Province?—I think there are 3 or 4 in this Province.

32068. In this women's hospital which you are going to have, are there going to be so many beds allotted for in-patients?—Yes.

32069. It is entirely for women?—Yes; it will be for female cases only.

32070. *Prof. Gangulee*: You do not get any help from the All-India Research Association?—No, because we are doing nothing; but if we could show that we wish to carry out some research then they could give us some assistance.

32071. What is your existing organisation for collecting vital statistics?—They are collected by the sanitary staff and by various other persons, the *patwaris*, the police and others. The Municipality keeps its own register and the police keep their own register and when either or both are doing nothing for a little time, they come together, compare notes and produce the register. The idea was that one should check the other. The system is defective and I think there should be a special trained staff through the whole of India and that it should work directly under the Public Health Department.

32072. Turning to the question of the malarial survey, what was the nature of the survey that you referred to?—It was a general survey conducted by Major Kendrick, on topographical lines.

32073. What are the qualifications of the Assistant Medical Officers?—The Assistant Medical Officers of this Province are trained at the Robertson Medical School and are examined by certain of us and by some outside examiners and we do the best we can for them. But the real difficulty is that the standard of education that these men have before they attempt to tackle medicine is so small and so low, that they cannot assimilate the things they are taught If I ask an ordinary question about the prevention of plague they take a long breath and say it is caused by this and that but they do not understand it and so they cannot apply it.

32074. They do not have adequate scientific education?—It is only a four years' course and the facilities are not many.

32075. What is the pay of the Assistant Medical Officers?—They start on Rs. 60 now and there is an agitation to start them on Rs. 100. At one time it used to be Rs. 20 and our Sub-Assistant Surgeon was getting Rs. 20 to look after the health of a regiment.

32076. You have got an Act called the Village Sanitation Act; when was that passed?—I could not tell you.

32077. Would you tell us the scope of that Act?—It is like a little panchayat they sit round and talk about things and they may also invite the Deputy Commissioner. I think, as a rule, they do some good.

32078. Not very effective?—No; but taking all things into consideration, I do not think they are at all bad.

32079. In matters of rural sanitation, what is the attitude of the District Councils?—It is very difficult to say; sometimes they are hampered by financial stringency

32080. Not lack of interest?—That is the excuse that is given.

32081. Is there any District Council in this Province taking any definite step for the improvement of rural sanitary conditions?—No. I cannot think of any special one.

32082. Financial stringency is almost universal?—Yes.

32083. We are told in another Province that irrigation is occasionally responsible for malaria. We should like to have your views on the point, whether you associate malaria with irrigation?—If the irrigation is done properly I think it is certainly not harmful as regards malaria; it may be rather beneficial. But in this Province irrigation is in its infancy and I am certainly not in a position to give an opinion as far as this Province is concerned.

32084. I think we have here four tracts, the Wheat tract, the cotton tract, the rice tract and so on. Do you find that the sanitary conditions vary in the different tracts?—No, I do not think so.

32085. You do not find that in the cotton tract of Berar, which we are told is rather prosperous the sanitary conditions are better than in the other poorer tracts?—I should say they are comparatively worse because it is very difficult to deal with the Beraris. The District Council will tell you that this is owing to lack of funds.

32086. You have said you have eight institutions for dealing with leprosy, all run by Missionaries?—Yes.

32087. To what extent does the Indian public support these institutions?—The Missionaries get a lot of money from England and America; and the Government subsidises them.

32088. What about the Indian public?—The Indian public in this Province subscribed over two lakhs recently to the Viceroy's Endowment Fund.

32089. Is there any leper institution entirely run by Indians, other than those that are run by the Missionaries?—No, there is none.

32090. About your propaganda work, do I understand that you are utilising the Education Department as much as you would like to?—Yes, certainly; we work hand in hand with them in many things.

32091. And with the Co-operative Department?—I do not know that I can say that exactly.

32092. You have not utilised that agency for propaganda work?—Where there is a big gathering, there we send down our men to lecture.

32093. In your note you tell us that this question of having a research institute here is before the Government. Is it in the form of a definite proposal?—I put it down definitely under every heading that I could, giving reasons as shortly and as strongly as I could, and it has been turned down owing to lack of funds.

32094. When was this proposal first made?—Before I came to this Province; there is a sort of Medical Administration and Finance Board which first considers these things before they go to the Legislative Council.

32095. The proposal did not go as far as the Legislative Council?—No; it did not go to the Legislative Council. I have spoken to one of the Ministers here and he is very sympathetic towards the proposal. But this time it is entirely a question of funds. I am told we have lost a lot of money, over 25 lakhs, through excise. The initial cost of a Public Health Institute was estimated at 3½ lakhs.

32096. Do you combine the Veterinary Institute in that?—It could be done.

32097. *Mr. Calvert*: You used the word 'eradication' with reference to malaria. Do you mean complete eradication?—Yes; if they can do it in places like Panama and other places, why can we not do it in India?

32098. They are tiny little places; India is a Continent?—If it can be done in one place it can be done in any other place, provided you have legislation to back you up.

32099. You think it could be done on a sufficiently large scale to be really valuable?—Certainly, because the work should be permanent.

32100. It would not prove too costly?—I do not think so, if it is done by a man who knows his job.

32101. You mentioned that Civil Surgeons are Health Officers; are they also in charge of the local jails?—Not always. In the central jails there is a separate officer; the Superintendent is a separate officer.

32102. They are in charge of the district jails?—Yes.

32103. Are you satisfied with the present division of funds between the preventive and the curable diseases?—No; I am not. You cannot do prevention work on an area of 100,000 square miles with an Officiating Director and two Publicity Officers.

32104. Is there much scope in this Province for rural sanitary engineering?—Yes.

32105. It could be done by a Provincial Sanitary Engineer?—A Sanitary Engineer is one of the most necessary requisites in public health. You may be a very clever engineer but you are not necessarily a sanitary engineer; that is a specialised job and I consider it is most essential, especially with regard to water-supply.

32106. *Sir Henry Lawrence*: Your total budget expenditure is about Rs. 4,50,000? Of this, how much do you spend on quinine?—I think it has gone up to Rs. 48,000 or Rs. 50,000.

32107. How much is spent on the Medical Department?—I could not tell you. The estimate in the United Provinces is Rs 47,00,000 or Rs. 49,00,000.

32108. In other major Provinces they spend from twenty to forty lakhs on public health?—I think my budget this year will be something under four lakhs.

32109. You are being retrenched, are you not?—I put up for a malaria bureau and as that will be cut out, the amount will come to about four lakhs.

32110. Your medical budget is about 14 lakhs this year. Would you like to reverse those figures?—Personally, of course, I would; we could then do very much more work than we are doing now.

32111. *Sir Ganga Ram*: Is tuberculosis on the increase in this Province?—I have not made any special investigations in this Province but from what I heard at the Indian Science Congress at Lahore and from the investigation that I made in the North-West Frontier Province, I have gained the impression that tuberculosis is increasing throughout India.

32112. Have you any special hill stations here for that?—There is a so-called tuberculosis sanitorium at Pendra which is run by a missionary doctor but I do not myself think that they do any special anti-tuberculosis work. I think it is simply a name to cover other activities of theirs.

32113. Do you not think that sometimes ordinary fevers are mixed up with tuberculosis?—Yes, that is so.

32114. Have you got any public health museum here?—No.

32115. Would it not be a good thing to have a public health museum located at Nagpur?—I think that would be a sound thing. Personally I think it would give a great deal of assistance in that direction. But I suppose you are thinking more of the education of students. We might of course have some health exhibits attached to the local college here. But this is an expensive business.

32116. *Sir Henry Lawrence*: Have you a Medical College here?—Yes, the Robertson Medical School.

32117. Up to what standard do they teach?—Up to the Sub-Assistant Surgeon standard. There is an agitation now to try and get the graduates' degree, but I am afraid I should hesitate to say that we have facilities for the necessary clinical material.

32118. The superior officers are recruited from elsewhere?—Yes, the posts are all advertised, and they come before a certain Medical Advisory Board of which I am a member.

32119. *The Chairman*: Has this medical school no laboratory facilities?—I suppose they have a certain amount of facilities, but from my point of view a public health laboratory and an ordinary laboratory are two different things. For instance, in the examination of water I look at the question from a different point of view to that which the bacteriologist would take.

32120. *Sir Henry Lawrence*: Does your local Council recognise the importance of spending money on public health?—I hope they will.

32121. Do you think you could get them to spend more money?—I am afraid I could not answer that question, but I think we will try to stir them up.

32122. *Sir Ganga Ram*: Are there any Salvation Army institutions in this Province?—I do not know. There have been Salvation Army people knocking about here, because one of them came to me and I gave him Rs. 15 the other day. But I am afraid that was for work in Madras.

(The witness withdrew.)

LIEUT.-COL. H. G. STILES WEBB.

Mr. SHYAM SUNDAR BHARGAVA, Managing Proprietor, Messrs. Chandrabhan Behari Lall, Jubbulpore.

Replies to the Questionnaire

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) So far in this Province selected seed and some improved implements only have influenced and improved the cultivation.

(*b*) Yes, in my opinion, field demonstrations ought to be carried on more freely free of cost for the first year in each village or group of villages and some sort of gathering should be arranged both at the time of demonstration and when results can be shown.

(*c*) Same as (*b*).

QUESTION 4.—ADMINISTRATION.—(*a*) Yes. Government of India should in each Province send their experts to study local conditions and their experts should be made more familiar with local conditions.

(*b*) Yes; for instance, if Central experts under Government of India make experiments and succeed in devising or selecting a threshing machine which would suit Indian conditions, Local Governments would not be required to do the same thing in their respective Provinces. The same thing may be said about all such improvements which are common such as improved furnaces for boiling sugarcane juice, method of cultivation of common crops like wheat.

(*c*) (i) The Agricultural Services are fair, but Veterinary Service should be more under the control of Agicultural Department so that they may be more useful to agriculturists. Moreover their training should also fit them to use simpler methods and medicines so that they can be of more use to village people.

(iii) ROADS.—These need great improvement and extension.

(iv) Satisfactory although common village people do not avail themselves of this department's activities.

(v) Fair.

(vi) Fair.

QUESTION 5.—FINANCE.—(*a*) Better financing of agricultural operations is urgently needed and some special banks known as Agricultural Banks should be started and these must in beginning be encouraged and helped like co-operative banks. Moreover Government should give more freely loans for these purposes.

(*b*) *Taccavi* loans have become very unpopular and in my opinion if advisory committees are appointed in each district or tahsil to advise at the time of giving and realising the *taccavi* it would become more popular.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are:—

(1) To meet the expenses required to meet all the agricultural operations, especially to buy bullocks.
(2) Marriages and other ceremonies.
(3) Purchases of land at times at very high price.

(ii) The sources of credit are generally the malguzar and village *sowcar*.

(iii) The reasons for non-repayments are:—

(1) Failure of crop.
(2) As the savings are usually so low that even in ordinary years they hardly maintain their family and when loans are taken for unproductive purposes it becomes very difficult to pay back.

(*b*) In my opinion, better facility to get loan and redemption of mortgage bonds will be enough, but as in places rates of interest are too high the Usurious Loans Act should also be applied.

(*c*) I think the other way; usually mortgage loans are cheaper in interest and therefore are more freely paid back and therefore I advocate right of mortgage and sale on all land held by tenant for a long term or with the permission of landlords.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Sub-divisions of holdings are great, but I cannot suggest any means by which to stop them.

(*b*) In my opinion, revenue officers should have instructions and power to force consolidation when so desired by exchanging land.

(*c*) I do not think this can be done.

QUESTION 8.—IRRIGATION.—(*a*) I suggest for all districts in the wheat and rice tracts of the Central Provinces extending the irrigation schemes of (i) and (ii) type, *i.e.*, perennial and non-perennial canals and tanks.

None but slackness on the part of Government to sanction new schemes.

(*b*) I have as yet not heard of these difficulties in my district.

QUESTION 9.—SOILS.—(*b*) In my district a system known as *bhandhwas* is in general vogue and its effects are very striking.

It shows marked improvement for quite a number of years and then, say, after 30 years or more, shows signs of deterioration.

(*c*) By ploughing it deep enough to up-root all *kans* and make it possible for cultivation. To this end the Agricultural Department tried motor tractors, but failed; and then the department got a steam tackle which, if it proves successful, will be able to do a lot to reclaim enormous areas in Jubbulpore, Damoh, Saugor, etc. Also Government should treat these ploughing and *bunding* operations as improvements for the purposes of *sanads*. This will induce the cultivators to get this sort of work done at any time irrespective of settlement periods.

QUESTION 10.—FERTILISERS.—(*a*) Yes, great use ought to be made of natural manures and rural population should be compelled to make necessary pits round the villages to throw cowdung and rubbish and also to utilise urine as manure, this will considerably improve the quality and increase the quantity of natural manure in each village.

(*b*) No.

(*c*) By free demonstration on cultivators' fields.

(*e*) I have been using ammonium sulphate on sugarcane with very good results.

(*f*) It is not much used as such in my district.

QUESTION 11.—CROPS.—(*a*) (i) There is a very great scope for improving the existing crops, by selection and by importing better varieties which give higher yield and resist diseases more.

(ii) New fodder crops should be introduced. The usual fodder which is available is of very poor quality in its dry stage and in many places cannot be used while green or as silage as it is not available everywhere.

(iii) The distribution of seed has played a very useful part in our part of the Province and if carried on more will give still more satisfactory and quick results.

(iv) The prevention of damage by wild animals requires help from Government. Up to now practically no help is being given. In my opinion, the following facilities should be given:—

(1) More licenses for guns.

(2) Pig hunting clubs to be formed for each area.

(3) Where Government forests adjoin the cultivation areas, if fences are constructed, the Forest Department should contribute something. Also long-term loans should be given for fencing.

(*c*) Peas, oats and ground-nuts have been successfully introduced by me in my farms and improved varieties of wheat have increased the yields and assured a regular crop owing to rust-resisting qualities.

QUESTION 12.—CULTIVATION.—(i) The existing system of tillage wants a great deal of improvement. About 15 years ago small iron ploughs were introduced, but owing to the War their prices became prohibitive. Their reintroduction is necessary. Also better implements to give hot weather tillage and light harrowing in the beginning of monsoon are necessary.

(ii) In my district wheat is the most important crop and it should be rotated by *masur*, peas or gram—no other rotation being possible owing to the *bhandhwas* system and character of soil.

QUESTION 14.—IMPLEMENTS.—(*a*) The following agricultural implements and machinery are urgently needed:—

(1) Sowing seed drills; (2) light harrow which may stir the upper layer of crust formed in the beginning of monsoon; (3) threshing machine; and (4) reapers.

The introduction of seed drills will greatly depend on the successful introduction of threshing machines.

(*b*) Demonstration of implements and sale on hire-purchase system. Also to make arrangements in many important centres in the district for repairing or replacing broken parts.

(*c*) The manufacturers or their agents chiefly in port towns are not able to demonstrate and sell on hire-purchase system, and do petty repairs. I suggest that either through Agricultural Department or through special societies or private agents this should be done; and in case Agricultural Department does not take up the work the agencies should get all possible help from the department.

QUESTION 15.—VETERINARY.—(*a*) Yes. The Civil Veterinary Department should be under the Director of Agriculture.

(*b*) (i) They are nominally under the District Board, but the Board has not enough control.

(ii) No.

(iii) No.

(*c*) (i) No. Agriculturists do not much use veterinary dispensaries, because they are situated very far from their villages and the treatment and medicines recommended are too expensive. They should be made cheaper by introducing country medicines.

(*ii*) Same as (i).

(*d*) I would recommend good propaganda and failing that I would recommend even legislation.

(*e*) No.

(*f*) Propaganda is necessary. No fee is charged.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Yes. The breeds should be improved. In my opinion cattle which can serve double purposes, *i.e.*, milch and draught, ought to be selected and improved.

(ii) Special facilities should be given to those who take up dairying. (1) Government should encourage by giving good bulls free or on nominal price. (2) Concessions should be given for grazing in Government forests and in growing fodder crops. (3) Agricultural Department should start model dairies and when fully established and become paying they should be handed over either to companies or private persons.

(iii) The present system of animal keeping in my district is one of very rude type. In fact no care is taken and all round it should be improved in feeding, breeding and weeding.

(*b*) (i) and (ii) The common pastures are getting less and less day by day and now pasture lands are such as are not suited even for growing ordinary grass.

(iii) Dry fodder in this district is only of two kinds—

(1) Wheat chaff; (2) dry grass from hilly areas and cut when dead ripe. The first one is exported in large quantities to the United Provinces and the second one is of very inferior quality and can rarely be obtained as cultivators have no reserve areas where they can cut grass.

(iv) Green fodder in dry seasons is not at all known but its cultivation should be encouraged under all irrigation tanks by charging specially low rates.

(v) I have already stated that fodder available in the Central Provinces (North) is of very poor quality and must be supplemented by better fodders.

(*c*) Fodder in grazing areas begins to be scarce from February and continues so till middle of July.

(*d*) Yes. Supply of fodder in my district can be improved and supplemented by the following ways :—

(1) Encouraging the use of silos and allowing Government forests free to cut grass.

(2) By growing fodder crops in rains.

(3) By growing green fodder under irrigation tanks.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) In my district the cultivator has not got much work on his holdings as most of them grow to a large extent winter crops and in other months they have very little to do. Specially in December, January and in rains they are practically free.

(*b*) Yes. Spinning and weaving and other cottage industries.

(*c*) Bee-keeping, poultry, sericulture and lac culture and basket-making cannot be taken up owing to caste prejudice and fruit-growing is not possible generally for lack of roads; water-supply and climatic conditions are also not very suitable.

(*d*) Yes. Government should establish industries which can be made profitable and to that end enquiries should be made.

(*e*) No. As industrial concerns engage permanent labour, neither cultivators nor agricultural labourers can get any advantage from them.

(*f*) Yes.

QUESTION 18.—AGRICULTURAL LABOUR.—(*b*) Yes, labour is getting very scarce and is due mostly to epidemics and poverty owing to uneven employment on agricultural operations.

QUESTION 19.—FORESTS.—(*a*) More concessions should be given to grazing; at present the rules permit only for bullocks and a certain number of cows. But dairy cattle should also get the same concession, and in blocks where grazing is not allowed, Government should allow cultivators to cut grass free both when green and ripe.

QUESTION 20.—MARKETING.—(*d*) I suggest that an agricultural magazine or weekly paper on a very large scale should be published either by Agriculture Department or private agency or through Agricultural Associations and this information may be given through them.

QUESTION 21.—TARIFF AND SEA FREIGHTS.—(*b*) Sea freights and railway freights do in many cases adversely affect the cultivators and they should be so changed that cultivators may get the best advantage.

QUESTION 23.—GENERAL EDUCATION.—(*b*) The rural education should be of such nature that the students may be taught from the beginning subjects like nature study, agriculture and gardening besides reading, writing and arithmetic in their own vernaculars.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) When improvements are fully introduced and return from agriculture made more regular and when men with capital can see model farms making good returns on their investment, then only they can put in more money.

(*b*) The following are some of the causes which discourage owners of agricultural land from carrying out improvements :—

(1) Uncertainty of rents owing to short-term settlements; (2) dependence wholly on monsoon and hence uncertain character of outturn; (3) title of lands in most cases is such that if the owner wants to sell his plot, he is not allowed by law to do so; (4) small holdings in many scattered parts of the village; and (5) crops liable to be destroyed by wild animals and difficulty in obtaining licenses for guns.

Oral Evidence.

32123. *The Chairman:* Mr. Bhargava, you are Managing Proprietor of Messrs. Chandrabhan Behari Lall?—Yes.

32124. You have provided us with a note of the evidence that you wish to give. Would you like to make any statement at this stage, or shall I ask you a few questions?—I should like you to ask me questions.

MR. SHYAM SUNDAR BHARGAVA.

32125. Would you tell the Commission what it is that your firm is engaged in?—We are mostly agriculturists. We have got 60 villages and about 4,000 or 5,000 acres of wheat.

32126. So that you are carrying on farming operations as a limited liability company, is that the point?—No: it is a private firm and two brothers are owners.

32127. How many acres are you farming?—About 5,000.

32128. And how many villages have you?—About 60 villages.

32129. What is the system of tenancy by which your cultivators hold their land?—We have generally all *malguzari* villages.

32130. No ryotwari villages?—None.

32131. Have your company any lands in your own hands?—All these lands are owned by ourselves. We are farming them ourselves. The total area of our estate is about 60,000 acres.

32132. And are the 60 villages you mentioned in the 5,000 acres or in the 60,000 acres?—They are in the 60,000 acres; we cultivate the 5,000 acres.

32133. And you are cultivating the 5,000 acres by hired labour, I suppose?—Yes.

32134. Of the 5,000 acres that you yourselves are cultivating, is any irrigated?—We have just been given a sort of monopoly for a big sugarcane plot. That has not yet come under the scheme: it is lying fallow and we have just started from the last two years to grow sugarcane on it.

32135. Are you irrigating that?—Yes.

32136. How are you irrigating it?—By canal.

32137. What scheme is that canal attached to?—The Pariat Irrigation scheme.

32138. Are you satisfied with the service that you are getting from the system?—Yes, I am perfectly satisfied, because we are the only people taking water from it so far.

32139. Have you any well irrigation at all?—None, practically.

32140. Any tank irrigation?—No.

32141. Apart from this sugarcane just described, what are your principal crops?—Wheat.

32142. What wheats are you growing?—We grow one known as 88, Central Provinces. That was the wheat grown on our farm for a very long time and the Agricultural Department took it from our farm and named it 88. It has been in our farm for the last fifty years. Then we are also growing Pusa No. 12. That is the second largest quantity; and the third is a special cross of our own.

32143. Do you carry on plant breeding experiments yourselves?—We employ one or two agricultural hands; and we have one experimental farm also.

32144. You claim to have yourselves discovered or isolated 88?—I do not know really; it was my father who did it; I was very young at that time.

32145. To the best of your knowledge and belief 88 was evolved on your farm?—I could not tell you exactly, because it was growing there for a long time. We simply gave the department the seed and how we got it, I do not know.

32146. Have you any experimental farm with a whole-time staff engaged on experimental work?—Yes.

32147. How many men do you employ?—We have got two Agricultural Assistants from the Nagpur College, and then I myself have taken a fancy to it and also do the work.

32148. How long has that experimental station been in operation?—Thirteen years now.

32149. Are you satisfied that it is a paying venture?—The experimental portion of it is not paying; but the results are very good.

32150. The results are profitable, are they?—Yes.

32151. Are you satisfied with the type of worker that you are employing on this experimental area?—I am.

32152. They were trained in the Nagpur College?—Yes.

32153. Do you have to pay high salaries to attract the right type of man? Would you tell the Commission what salaries you pay?—I am paying one man Rs. 150 and the other Rs. 85.

32154. What area have you got under experimental crops?—The experimental portion is about 90 acres.

32155. Now, are the results achieved by this experimental station of yours used only by yourselves on your own estate or do you do work for other persons in the neighbourhood?—The other persons of course copy us and we have no objection to tell them the results and allow them to copy them.

32156. Do you think that they take interest?—In some of the things.

32157. Would you tell the Commission what experience you have had in the matter of manuring for wheat? What manures are you using?—We do not use manures for wheat on our side, because unirrigated areas can do without manures.

32158. You use no fertilisers at all?—No fertilisers at all. The only thing that we do to keep up the fertility of the soil is to have a rotation of crops.

32159. What is your normal rotation?—A kind of pulse called *masur*, also peas and gram, but *masur* is the chief thing.

32160. *Sir Ganga Ram:* No cotton?—We have no cotton on our side.

32161. *The Chairman:* How often do you grow wheat on the same piece of land?—We grow wheat for five or six years, and then give a rotation.

32162. You grow 4 or 5 wheat crops running on the land?—Yes, and then there is a rotation for one or two years.

32163. A rotation with other crops, and again you grow wheat?—Yes.

32164. How long has that been going on in your land?—I should say for quite a long time. This practice was used by my father; he was a big farmer himself.

32165. Has that been going on for thirty years?—Much more than that. Our farms are about ninety years old now.

32166. What is your average yield per acre in a good year?—About 9 to 10 maunds.

32167. You can maintain that on the system which you have been describing?—Yes. All these lands have been under wheat cutivation for at least eighty to ninety years now.

32168. Have you experimented with cowdung?—We have, but we generally use cowdung for our paddy crops.

32169. What is the result of manuring with cowdung on your wheat land?—It does good, but we cannot find enough of it.

32170. Do you mean to say that you are so short of manure that you prefer to concentrate on your rice crops?—Yes, but we grow rice in very small areas in each village.

32171. Is that mainly for food for your employees, or do you market the rice?—We mainly give it to the labourers.

32172. You pay in kind?—Mostly in kind.

32173. To what extent have you succeeded, if you have attempted it, in persuading the cultivators on the rest of the estate to sow improved varieties?—They are forced in a way, because we lend them the seed, and we generally lend them improved seed; so they are forced to grow those varieties and they like them.

32174. On what basis do you lend the seed?—It is *sawai;* we charge one-fourth of what we give in seed.

32175. You are repaid in seed?—Yes.

32176. Apart from that, do you, as a farmer, lend money to the cultivators?—We lend money to our own cultivators, not to outsiders.

32177. *Sir Ganga Ram:* At what rate of interest?—From 12 to 15 per cent per annum.

32178. *The Chairman:* Are there any co-operative credit societies operating in your neighbourhood?—I was Secretary of the Jubbulpore Central Bank for a long time, but in spite of my efforts all the societies in my villages have been closed down.

32179. Why?—They do not like joint responsibility.

32180. Who decided to close them down?—They themselves.

32181. How many societies were at work?—There were about 7 in my villages.

32182. They have all disappeared?—All except one have disappeared, and even that one is only lingering on.

32183. Did you take over their responsibilities?—Not much, about 10 per cent of it.

32184. Before they went into liquidation?—Yes. Although I persuaded them to the best of my ability not to go into liquidation, I was not successful. I am still connected with the Central Bank; I was its founder, and for twelve years I was its Secretary.

32185. Are these estates your own estates or the company's estates?—We are two brothers, and they are our estates.

32186. On your private estate, are the tenants seriously indebted as a class?—They are not at all seriously indebted. In a good many villages, there are absolutely no debts.

32187. Your principal crop for marketing is wheat?—Yes.

32188. How do you market; do you go through the ordinary markets, or do you go straight to the merchants?—We have got our own grain shops.

32189. That is retail?—They are for exporting it to Bombay. We have got our own grain shops at the railway stations, and along with the grain shops we have got our own firm.

32190. Of merchants?—Our own shop, I should say, where we stock it and send it to Bombay.

32191. Where do you yourself actually part with the wheat, at your station or at Bombay?—At Bombay.

32192. You hold the wheat till you get to Bombay?—Yes.

32193. Do you forward the wheat from other cultivators?—Yes.

32194. So that you are, in fact, merchants?—We are merchants also. We always get much better prices in Bombay. The name of our firm is well known down there for quality, as we have been growing wheat from selected seed for the last fifty years at least.

32195. Where do the cultivators on the estates, who are cultivating their own holdings, market their wheat?—They generally bring it to the railway station, and sell it off either to our firm or to other firms at the railway station.

32196. In cases where you lend seed to cultivators, I suppose the whole crop comes to your hands?—No, we claim only the seed.

32197. They are free to do what they like with the merchants?—Yes.

32198. In fact, do they usually come to you?—Not always.

32199. When they do come to you, how do you fix the prices that you give them?—The prices are governed by the Bombay rates.

32200. What I want to get from you is, does the cultivator bringing his wheat to you get better prices for it than he would get if he went to the local market, where of course the wheat would have to carry all the marketing charges?—I do not think that there is much difference between these two, because after all in the market selected varieties of wheat are sold.

32201. But probably there is the municipal tax to pay?—We have to pay those ourselves.

32202. Where do you pay those dues?—If there are municipal limits, as soon as we come within the municipal boundary, we have to pay, and if we go out we get a refund; that is, when we export, we get a refund.

32203. So that you do not, in fact, pay them?—But then I think the merchants calculate on the expenses between the local place and Bombay.

32204. I am concerned with the price the small cultivators are getting for their grain, and I am trying to get from you whether, when that small quantity is brought direct to you as a merchant, the cultivator gets a better price than he does when he takes the grain to the ordinary local market?—I do not think there is much difference. The only advantage that we get by having these export firms which send the goods to Bombay is that we can regulate the quality right up to the delivery of the goods in Bombay. Otherwise Pusa 12 is mixed up with another variety of hard wheat, and they get less price. Outside that, I do not think there is any practical advantage, because there is so much competition in the market that the local tenant does not lose much in prices.

32205. I do not quite understand. Do you take grain in bulk from your cultivators, or do you make them bag the grain?—We take it in bulk.

32206. So that the ordinary charge for bagging is saved?—Yes.

32207. What about the ordinary *dalali*, that is to say, the brokerage in the local market; is that charge not saved?—That is saved.

32208. What about charity tax? Is that paid when the grain is brought straight to you?—No. If the tenant gives us his grain, he generally does so in his village, but if he goes to the market he generally goes to the other firms.

32209. Do you charge for *adtri;* is there any fee for advancing?—We do charge, just as we charge any other man.

32210. And yet, in spite of the savings which you and I have agreed do exist, you do not think that the cultivator gets better prices for his wheat when he brings it to you than when he takes it into the local market?—There is not much difference.

32211. How many pairs of bullocks do you keep on your estate?—About 400 pairs.

32212. Have you any system of growing fodder for them?—None, excepting a bit of *juar*. We do not have any other fodder except grass on our side; grass is plentiful.

32213. You have no fodder shortage?—No.

32214. Can you keep your bullocks in fair condition throughout the year?—Yes. In fact, for any number of cattle we can have fodder there, as it is very cheap. Now, with the irrigation canals, we are attempting a number of varieties of fodder, and the ones that I have grown so far have been most successful. I have tried *berseem*, Guinea grass and carrots.

32215. You store the carrots and keep them?—Last year we tried to grow them for about 4 months in batches; this year I am going to dry them up, because I can grow them cheap; my cost, all told, does not exceed 1½ annas per maund.

32216. *Sir Ganga Ram:* What about turnips?—We have tried them, but they do not grow well.

32217. *The Chairman:* And Guinea grass?—It does well, but it does not grow during the winter months.

32218. How about the provision of fuel for the villages on your estates? Is there any difficulty in providing for that?—We have forests near almost all our villages.

32219. Belonging to the villages?—Yes.

32220. Do you control the grazing in those forests?—Not in the whole of the area. If the forest area is much bigger than the general requirements of the village we reserve some of it and allow free grazing, timber and fuel in the rest.

32221. Do you attempt to control the cutting of wood for fuel?—Yes, if we think there is too much for the village we reserve some of it. It depends on the size of the forest and the population of the village.

32222. Is the supply of fuel keeping up, or do you think it is diminishing?—I do not know. We have not had any complaints from the villagers.

32223. On page 427 you refer to the better financing of agricultural operations and suggest the setting up of special banks to be known as Agricultural Banks. Are you thinking there of land mortgage banks?—Yes.

32224. Are not the cultivators in your villages holding their land on occupancy terms only?—Yes.

32225. Have they anything at all to mortgage?—Not very much.

32226. Do you think land mortgage banks are likely to be successful in that case?—In the case of malguzars they would be. There are some people who hold land on absolute transferable rights. I would recommend that after a certain period of years occupancy rights should be made transferable.

32227. So far, I take it, you have been dealing with the provision of long-term credit for land improvements and so on. What about short-term money? Do you think the primary credit society is the best means of providing for that need?—I still think the co-operative banks are best, working through primary credit societies.

32228. You think that is the best way of assisting the cultivator?—I can think of no better.

32229. But you have not succeeded in keeping alive a single society on your own estates?—That is so, but I cannot think of anything better.

32230. Have you any experience of the administration of *taccavi* loans, and any suggestions to make in that connection?—I am not well acquainted with that subject.

32231. Have you known cases where applications which seemed to you reasonable have been refused?—I do not know much about it.

32232. Do you keep a special veterinary service of your own to deal with the large number of working bullocks you possess?—No.

32233. Have you considered the wisdom of a step of that sort?—We depend on the crude methods of the villagers who treat the animals.

32234. Do you yourself believe in modern veterinary practice, or do you think the indigenous methods are good enough?—I have not tried the new methods much because our farms are far away from the veterinary hospitals.

32235. Have you veterinary dispensaries under the Local Boards in your district?—Yes.

32236. Do they not serve the population on your estates?—They do. I have been Chairman of the District Board for the last three years. Those dispensaries, however, are generally used for inoculation against rinderpest and for castration, and not for other purposes.

32237. Have you advocated the wider employment of professional veterinary skill amongst your cultivators?—They get very little chance of using it, because they are so far away from the nearest veterinary station.

32238. What about meeting the emergency of epidemics? Do the veterinary officers carry out inoculation against rinderpest?—They do, and that is successful.

32239. Is that popular with the people?—It is becoming so.

32240. With regard to fodder, have you attempted to make silage?—Yes, we have been using silage for the last fifteen years, making it in a pit.

32241. Has it been a success?—Yes.

32242. How much do you make?—It is for a herd of 60 cattle. We use about 2,000 maunds of wet grass.

32243. Is that for a working or a milch herd?—Milch.

32244. What do you do with the produce of that herd?—Sell it in the city.

32245. Retail?—Yes.

32246. Who consumes it?—There is a big demand for dairy produce in the town.

32247. Is it a profitable side of your business?—Not yet.

32248. You hope it will be?—Yes. We are trying to cross the breeds.

32249. So as to increase the milk yield?—Yes.

32250. Are you getting any working males from that herd?—We are.

32251. Are you satisfied with them?—Yes.

32252. Have you a bull that satisfies your requirements?—Yes. For a long time past we have been getting bulls from Hissar. Our old home is near Delhi, in the Gurgaon district.

32253. You get your bulls from that district?—Yes.

32254. What are you going to do to increase the milk-yielding qualities of your herd?—We find two things are sufficient: breeding and feeding. The use of Hissar bulls and proper feeding are sufficient. We have enough fodder but it has a very low nutritive value, and so though the animals used to get enough to eat there was nothing to keep up their milk-yielding qualities.

32255. What have you to say about silage in relation to milk-yield?—It is much better than dry grass.

32256. You are rapidly approaching a stage where you may hope to have a profitable dairy business?—Yes. I have lost over Rs. 60,000 on dairying experiments (the dairy is attached to my experimental farm) but now we have much better hopes, because some of the heifers are giving 28 lbs. of milk a day.

32257. I think you are doing a public service as well?—It will take another ten years before we have a large enough herd to make the whole thing pay.

32258. *Sir Henry Lawrence:* What cows are you working with?—The local Jubbulpore cows. We got some cows from Hissar, but they are too delicate for this climate.

32259. *The Chairman:* Are your neighbours taking an interest in these activities of yours?—I do not think so, because they see we have lost money by them, and they think these experiments should pay immediately.

32260. They are waiting until you succeed, and then they will copy you?—They will not only be able to copy us, but take advantage of our bulls and breeding.

That is good business from their point of view.

32261. *The Raja of Parlakimedi:* Wheat is your principal crop?—Yes.

32262. Is it bearded or unbearded?—Mostly unbearded. We grow bearded wheat on our border lands, where we have considerable trouble with pigs; but not much.

32263. Do you grow the whole area as an irrigated crop?—No, we do not grow irrigated wheat. We have embankments round our fields which keep the water there from June to October and leave enough moisture on the land to allow of a normal wheat crop.

32264. In times of drought, would it not be better to have the possibility of irrigation?—In times of scarcity our water tanks would remain empty.

32265. If the tanks were filled in the rainy weather there would be enough water left in them when the wheat matured, and you could irrigate it from that?—It would not be practicable in my district; we cannot have irrigation unless we have a small stream, or something of that sort. Dams which merely hold up the water which comes in the rains are generally exhausted by the time we require water for wheat. That is the general complaint against irrigation tanks in my district.

32266. Do you get better price for the bearded or the unbearded wheat?—There is not much difference between the two, as long as they are the right varieties.

32267. Of the two, which is the better drought-resisting variety?—The bearded. Rust is our chief trouble, and the unbearded is the better rust-resisting variety.

32268. You say on the first page of your note that demonstrations ought to be carried out more freely and free of cost. What is the rate charged at present for such plots?—What I had in mind there was this sort of thing. For a number of years we have been using an improved plough, called the monsoon plough, on our estates, and we have a large number of them. They have proved very useful, but the poor villagers have not been able to adopt them. Lately the Agricultural Department has been trying to reintroduce the iron

plough. Iron ploughs were introduced in our district before the War, but the War sent the price of them up to such an extent that they had to be given up, and the people forgot how to use them. Now we want to bring them back into general use. The difficulty comes in when you go to a village and tell the man that the Government will plough for you at so many rupees an acre. He hesitates to pay anything before he actually knows what the results are going to be. No doubt people look at it from the point of view that so much area is ploughed for so many rupees; they do not know that it adds to the fertility of the soil. All these things have to be shown to the people free of charge, at least for the first time. I do not mean to say that every tenant in every village should be shown. A central place might be chosen to which people from 7 or 8 miles could come and see the demonstration carried on. They may do like that at different centres. Once the people know that a certain plough, for example, gives good results they will certainly go in for that. It is very few that are so advanced as to go in for these improvements at once without practically seeing the results.

32269. What plough do you use on your field?—For every day use we use the wooden ploughs; but in every three or four years we use the other ploughs and turn the soil.

32270. How about the people in the locality? Are they convinced of the benefits of this sort of cultivation?—They are; we have got a steam tackle outfit now and people would pay even Rs. 17 for having their land ploughed with it once.

32271. Who has introduced it?—The Local Government has purchased it. We, the Legislative Council members, pressed to get the money sanctioned and it is now in use in our district. It is the first steam tackle we have in the Central Provinces and it was working on my farm last month. It looks as if it is going to be a very good thing; it will do very much good to our part of the Province.

32272. People are taking to it?—Yes. The tractors are a failure in our Province.

32273. How many acres per hour can a steam tackle outfit plough?—If there is a big square field I think it can plough at the rate of one acre per hour.

32274. How deep does it go?—From 9 inches to 14 inches; but I have been content with 9 inches.

32275. What part of an acre can it plough in one hour, how many cents?—If you want a depth of 9 inches it can plough about an acre in one hour; that is what I have done on my farm; of course it depends on the soil, the size of the field, the moisture in the soil and so on.

32276. What kind of soil exists in your estate largely?—Black cotton soil mostly, on which we grow wheat.

32277. Why do you not try cotton?—We have too much rainfall; our rainfall averages between 50 and 60 inches in the period from mid-June till mid-September; then the dry weather sets in so that there is not time enough for cotton to mature.

32278. On page 427, you say that the Veterinary Department should be under the Agricultural Department?—Yes, that is my view because I think it will then become more popular than it is now. My experience is that the Veterinary Services are not much appreciated or used by the villagers because they are far away and are stationed in big towns generally and these villagers cannot go to the towns. They do not get these services in their villages and so the cases there are not treated at all. If we attached the Veterinary Service to the Agricultural Department the Agricultural Assistants would try to advocate the use of the veterinary treatment during their tours and so on.

32279. Are you taking advantage of veterinary science on your farm? Are you getting your cattle treated by the Veterinary Department people?—Except for inoculation and castration I am not using them on my estate.

32280. For the general treatment of the cattle, whom do you depend on?—I told you about the old method of the *gaolos;* the old man in the village does the whole thing.

32281. We have been told about the hot iron touch if the animal suffers from stomach-ache and so on. Do you adopt that system?—If the old man advises we have to follow it.

32282. You have on your farm some people trained in agriculture to tackle cross-breeding or inter-culture of crops. Why do you not have a man qualified in veterinary science and see whether his methods are more efficient in comparison with the local indigenous methods?—I must admit that we have not paid enough attention to the cattle side; beyond that I cannot say anything. For the last so many years our attention was divided between improved implements and improvement of cattle. For instance, we have tried tractors and things like that in order to avoid having bullocks, but they have been a failure. Now the Government is demonstrating steam tackle ploughing and if it proves successful we may go in for more such things.

32283. Is your whole farm on one level or on different levels?—I have got one block consisting of 48,000 acres and comprising 40 villages; the rest forms another group.

32284. Let us take the largest block; is it fairly level?—Excepting small hills and streams the whole is fairly level.

32285. In that area how have you divided your fields? How many acres would a field consist of?—Each field ranges from 2 to 40 acres. Each is *bunded* round with a mud wall from 3 to 10 feet in height.

32286. In such large fields could you not make use of machinery for ploughing?—We could, but we have not yet had enough time to say anything. We have tried tractors and we have found that they are not powerful enough in my part of the country. I am told that in Nagpur they are doing well but I understand they are costly things. Experiments with such things ought to be taken up by the Government so that if they turn out to be successful the villagers will follow them, otherwise not.

32287. Why do you not ask your Local Boards to devote some of their funds for such experiments?—I was Chairman of the District Council myself till about two months back. Our District Boards are very poor and they cannot afford to incur such expenditure.

32288. What is the revenue of your Board?—It is about 3 lakhs of rupees and we have about 253 miles of road to maintain in the Jubbulpore district, and besides we have 250 schools to run and we are hardly able to pay the school teachers. I could not myself do it although I was at the head of the whole show.

32289. Are your roads maintained efficiently? Are all of them metalled?—Very few of them are metalled, but that is again due to lack of funds. We could not get anything during the last three years from the Local Government because of the policy of the Swarajists, of whom I was one, and we could not run dyarchy in this Province. Whatever it is, I think it is beyond the power of the Local Boards in our Province to undertake such things.

32290. What consumes most of the District Board's revenue?—The school teacher, education.

32291. Up to what standard do the schools teach?—We teach only vernaculars, mainly Hindi.

32292. What is the average pay of the teacher?—The highest teacher gets Rs. 45 and the lowest Rs. 20, and we have something like 410 teachers.

32293. Who controls their appointment?—The District Board.

32294. Is it done through a committee?—Just a small committee known as the Education Board.

32295. Do you have any sort of examination for selecting them?—They are all trained teachers, trained in the Government schools.

32296. Before appointing them you insist upon a certificate of training?—Yes; we only take trained teachers.

32297. Suppose you had only two appointments and half a dozen applications, what test would you apply in selecting the candidates?—If all of them are trained men of course recommendations and things like that go a great way; otherwise we select according to the certificates they have.

32298. *Sir James MacKenna:* Have you had any agricultural training yourself?—No.

32299. You know just the business side of it?—Yes.

32300. Have you found the local Agricultural Department of considerable assistance?—I have tried to take the fullest advantage of it.

32301. What sugarcane do you grow?—We are now trying to grow CO. 210.

32302. How is it doing with you?—It is doing fairly well.

32303. That I suppose is introduced by the Agricultural Department?—Yes; Mr. Sayer when he came here recommended it.

32304. How are the Pusa wheats doing; there was a certain amount of comparison drawn between them and the local Jubbulpore wheats?—They are doing well. Pusa 12 is the best with us.

32305. Is it better than the local varieties?—Yes; it is much better; it does very well on the best land. Supposing we have a first class field and we put Pusa 12 on it, we can expect 10 maunds, and if on the same field we put any local variety we would only get 8 maunds. But, on the other hand, if we put Pusa 12 on inferior land the results would be the other way; Pusa 12 would yield less than the local variety. I consider therefore that Pusa 12 would do very well on fairly well cultivated land.

32306. The standard of cultivation is an important factor?—Yes.

32307. You lend money to your tenants at 10 to 15 per cent. Are your tenants of long standing?—Yes.

32308. A sort of feudal relation exists between them and you?—Yes. Most of the villages are under us for the last 80 or 100 years.

32309. So that there is a feeling of personal attachment always between the tenants and the landlord?—Yes.

32310. You do not think that it has perhaps something to do with the success of the co-operative societies if the personal touch is so strong?—When I became Secretary I tried to persuade the co-operative societies to lend money actually at 9 per cent, because the reserve fund will be their own and, if there are honest assistants, they can use it for some public benefit in their own village. All the same I am sure there are some people who try to take undue advantage of the joint responsibility and the villagers are now getting nervous about joint responsibility.

32311. You think that is the reason, and not the fact that you give money at a comparatively cheap rate?—In fact I refused to give them money and insisted on giving it at 24 per cent to those very people who were members of the societies to try to discourage them from taking money from me; but in spite of that they would not go to the societies; then I withdrew that condition and gave them money at the original rate.

32312. Were you or are you a member of the local Legislative Council?—I am now a member and I was in the last Council also.

32313. And you told us that you were a Swarajist?—Yes.

32314. What is the attitude of the Council towards agricultural questions?—I hope it will be quite good.

32315. In the last Council?—In the last Council our policy was not to work the Transferred side at all, whether it was veterinary or agricultural.

32316. Although you are an agriculturist you had to sacrifice your interest to political exigency?—I am a malguzar and I still advocate that occupancy tenants should get transfer rights; perhaps if my constituents know that I advocate transferring of occupancy rights they will not elect me again. This time I am sure that the Council's attitude is going to be very sympathetic.

32317. *Prof. Gangulee:* Do you employ many farm labourers?—Yes.

32318. Do you pay them cash wages?—Mostly in kind.

32319. What is the arrangement?—We generally pay about Rs. 2 a month cash and the rest is given in grain.

32320. How much grain do you give?—It is given several times in the year. At the close of the harvest they get something like two bags each, and then they get something monthly as well. We have a standard of wages. We pay Rs. 7-8-0, *i.e.*, Rs. 5-8-0 worth of grain and Rs. 2 in cash.

32321. The total wages for 30 days is Rs. 7-8-0?—Yes.

32322. This farm is solely in your hands?—Yes.

32323. And when you come to town who looks after it?—We have got a paid staff in every village; a farm manager.

32324. How many farm labourers do you employ from season to season?—Generally we have about 400 men on the permanent list, but it all depends on the seasons.

32325. What is the average wage per labourer in your district?—From 4 to 5 annas a day per man.

32326. Do you keep farm costings of your operations?—Yes.

32327. Could you give us the cost of cultivating an acre of wheat?—I have not got any papers here with me.

32328. *Mr. Calvert:* Could you give the cash requirements for cultivating an acre of wheat?—Generally in our district it costs us Rs. 20 an acre.

32329. *Sir Ganga Ram:* Do you pay the revenue or do the tenants pay?—For instance, on our own farm we consider ourselves in two capacities: one as the landlord of the village and the other as the farm manager. For the farming side we have to charge rent just as is charged for wheat and credit it in our own books as a landlord in the same village.

32330. *Mr. Calvert:* You say the Usurious Loans Act should be applied? Is it not being applied?—No; generally, towards our side, even if the tenant has got an understanding with the banker to pay something like 40 per cent interest, he would get the same sort of decree.

32331. *Sir Thomas Middleton:* You are your own landlord? What is your land charged at?—My lands have been charged at very low rates at this settlement. The rates will be enhanced very much this year because my father did tremendous improvements in the way of *bunding* up fields during the famine of 1900. The Central Provinces rules are that if one spends Rs. 25 per acre on improvements then for one term of settlement the same rent is allowed and there is no enhancement.

32332. That is with regard to your land revenue payments. But we are talking now of the payment of rent?—In this Province, the Settlement Officer fixes the rent for each plot whether farmed by the owner or by a tenant. A list is made out and for each plot of land they fix the rent. The whole thing is totalled up and 50 per cent roughly goes to the Government and 50 per cent remains with the landlord.

32333. You told us you were yourself owner and occupier of 5,000 acres. You keep books and you credit yourself as the owner with your rent. On that 5,000 acres how much rent do you credit yourself with as owner?—At present Rs. 6,000, but it will go up in the usual course to Rs. 15,000.

32334. You have come to the conclusion that dry fodder is not a suitable dietary ration for cows?—Neither for cows nor for bullocks.

32335. How do you feed your dairy cows in the dry season?—We have been experimenting so far and pumping up water from the river and growing a small area but now we have a big irrigation scheme practically at our disposal.

32336. You are trying to grow green fodder?—Yes, only for the past two years.

32337. What are you giving them, in the way of oil-cake or grain?—Oil-cakes we get in the local market.

32338. What are you giving your cows?—I am giving my cows about one-third grain for the milk that they yield and I feed them with carrots.

32339. Who told you to give them one-third? Have you been consulting the Agricultural Department?—I got my idea by reading the American papers.

32340. Do you know whether any people in your district give their milking cows oil-cake?—Every one does.

32341. Do you give *chuni*?—Yes.

32342. What kind of *chuni*?—It is mixed and comes from various places and we are unable to distinguish from which *dal* it is made.

32343. And everybody uses that for the milking cows?—Yes.

32344. What happens if the cows are not being milked but are rearing calves?—Then no *dhana* is given.

32345. Do you breed any of your own work cattle?—We have got a large number of cattle which we allow to graze in the forest and from these we get our working stock.

32346. You do not require to give *dhana* in any such cases?—No, but they must be of small type and small cattle.

32347. *The Chairman:* You and your brother, in association, are farming these 5,000 acres of land as a large scale operation and you told the Commission that you have very complete costings? I think it would be of very great help to the Commission if you could assist us in discovering how large scale farming compares in the matter of profit with small scale farming as practised by the cultivator, and if you could let us have as many of your figures as you would care to entrust us with, we should appreciate it very much; and if you would plainly mark such of your figures as you do not want published that would be of help?—We have no secrets.

32348. Can you at this moment express any opinion as to the varying profitableness of small scale operations and large scale operations?—The small scale operations are generally adopted by those who have small lands.

32349. I am thinking at the moment purely of the economics?—According to the Indian custom the holdings of a man are divided every time a man gets a son. I know that it is a great drawback especially because it scatters the holdings.

32350. You and your brother are alive to the disadvantages of sub-division, I take it. But you have kept together in this?—Yes.

32351. So that you have been impressed with the importance of large scale operations where possible?—Yes, I am. We have tried to make our farms as compact as possible in our villages. For instance, if we had 50 fields scattered over the whole area we have tried to exchange that with the mutual consent of the villagers. In our Province once the land is given as occupancy right it is not left to our option to take back the land except with the consent of the tenant.

32352. What is the largest rice field that you have?—I am not doing much rice cultivation; the total does not exceed 50 acres.

32353. As regards wheat, have you got any very large fields?—Some of them are 90 acres, all *bunded* about 30 feet high.

32354. 30 feet *bund* all round?—Not all round, just on one side.

(The witness withdrew.)

Mr. H.H. PETERSON, B.A., Secretary, Y.M.C.A., and President, The Empress Mills Co-operative Stores, Ltd., Nagpur.

Note on the Marketing of Grain.

I understand that surplus grain produced by the cultivators is ordinarily disposed of in one of three ways—

(1) Sold to the local malguzar or given to him is repayment of loans.

(2) Sold to a travelling merchant, such as the *Kutchhi*, who may perhaps have given cash advances previously.

(3) Sold in a *ganj* or market in a larger town.

It is with this last method only that I am conversant. Grain is brought in carts, sometimes from a distance as great as 100 miles by the cultivator to the *ganj*. Here it is sold either by auction or private sale to a wholesale merchant, through the instrumentality of a *dalal*, or petty broker, who takes a commission from both parties. Ordinarily the *dalal* is registered by the local municipality and the *ganj* is more or less supervised by them. After the grain has been measured and paid for, the cultivator is free to return to his village. One individual seldom brings into the *ganj* more than 10 or 20 bags of grain at a time.

I would suggest two ways of improving the existing system of marketing :—

(1) Standardisation of weights and measures.

(2) Improving the *ganj*.

Let me first point out the present confusion of measures. In the Central Provinces grain is usually measured by quantity, not weight. The unit of quantity is supposed to have some relation to weight, but often is wide of the mark. For instance, in Nagpur, the unit is the *paili*. There are eight *pailis* to a *kudu* and 20 *kudus* to a *khandi*. The Nagpur *paili* is supposed to contain 100 tolas by weight (the weight of 100 silver rupees) but actually it contains about 105 tolas. For a few places the units and amounts are—

		Weight in tolas.	
Town.	*Unit.*	*Nominal.*	*Actual.*
Nagpur	Paili	100	105
Bhandara	Kudu	800	850
Tumsar	Kudu	800	860
Raipur	Khata	400	390
Drug	Khata	365	Unknown.

Besides these variations in the measures used, there are two other serious objections to the measuring of grain by quantity rather than by weight. In the first place, measuring by quantity takes much longer than to weigh a bag and costs far more in labour charges. In the second place, there is much more chance for fraud. A clever man can easily add or substract 5 per cent from the correct amount. Merchants frequently bribe the measuring coolies and this fraud is impossible to detect unless the grain is remeasured. In May 1926 the Nagpur *ganj* was closed for a week on this account.

I would suggest, therefore, that steps should be taken to abolish all such measures of quantity and that the standard seer of 80 tolas should be adopted as the unit for measuring grain. This would suit both wholesaler and retailer admirably. For wholesale transactions the rate would be so many rupees per maund (of 40 seers) and for retail, the simplest measure would be so many seers per rupee.

Gunny bags for grain vary in capacity from 2 to 3 maunds with the average at about 2½ maunds. Under the weight system, each bag could be filled full irrespective of the size of the bag.

As regards improvements in the *ganj*, I have several suggestions. Grain is sold by two methods in different places. In the majority, it is sold privately, that is, buyer and seller are brought together by a *dalal*, or petty broker, who takes rather a large commission for his services (about half per cent of the value). He has no

other function than to arrange the sale. Since the wholesale merchant buys many times and the individual cultivator sells only once, it is obvious that the *dalal* will ordinarily favour the merchant rather than the cultivator and will try to beat down the price as far as possible and close the bargain before some other merchant can offer more.

I feel that the *dalal* can be dispensed with altogether, provided that his small part of the transaction can be accomplished in some other way. The best way to do this is to sell all grain by auction. This is being done in some places. The *dalal* has not been done away with entirely even there, for his is an ancient profession in India. It is quite possible, however, to do away with him and several other evils in the scheme I propose

All grain should be sold in the *ganj* by public auction. The auctioneers should be employed and paid by the municipality and they should keep a public record of every transaction. Upon bringing his grain to a *ganj* the cultivator should be obliged to pay a fee of about ½ anna per bag. This fee would entitle him to the services of the auctioneer, and two days' rent of the space occupied by his grain. All sales in the *ganj* should be by auction, though the seller would have the right to refuse the price offered in the auction. (This is the usual custom at present.) If the seller did not sell his grain within the two days, he would be obliged to remove his grain or pay the fee again for an additional two days. Upon sale, the grain would be filled into bags and weighed on the official *ganj* scales, which should be of the direct reading kind and capable of weighing not less than 10 bags at a time.

The chief advantages of the scheme would be—

(1) Prices would be stabilised since all transactions would be in public.

(2) The inexperienced or ignorant cultivator would be less likely to be imposed upon.

(3) All fees at present paid to the *dalal* by both parties would be eliminated.

To show that this scheme is quite practical financially, I have drawn up a rough budget of receipts and expenditure for a *ganj* such as I propose. The figures, of course, can be only very rough:—

		Rs.
Capital Expenditure—		
Cost of land	...	10,000
Cost of buildings and equipment	...	10,000
		20,000
Expenditure—		
Interest on investment at 6 per cent	...	1,200
Depreciation at 4 per cent	...	400
Salaries: 1 head auctioneer at Rs. 60 per mensem (12 months)	...	720
5 auctioneers at Rs. 40 per mensem (12 months)	...	2,400
5 do. do. do. (6 months)	...	1,200
1 clerk at Rs. 30 (12 months)	...	360
1 armed watchman at Rs. 30 per mensem (12 months)	...	360
4 ordinary watchmen at Rs. 15 per mensem each (12 months)		720
1 sweeper at Rs. 10 per mensem each (12 months)	..	120
Stationery and miscellaneous	...	200
Total	...	7,680
Receipts—		
For 6 months at the rate of 2,000 bags per day For 6 months at the rate of 1,000 bags per day Total bags 540,000 at 6 pies	...	Rs. 16,875

So far I have discussed principally the first part of the marketing system—the sale by the producer to the wholesale dealer. For the balance of the process by which the

grain gets into the hands of the consumer, I feel that the use of figures will be most satisfactory. The accounts I will give below are to be considered typical of the purchase of a wagon load (200 bags) of medium quality rice in Raipur, the centre of the largest rice-producing area in these Provinces, its shipment to Nagpur and distribution to the consumers.

	Rs.	a.	p.
Purchase price of 200 bags of medium quality rice in Raipur *ganj*. Rate taken as Rs. 13 per bag of half Nagpur *khandi*	2,600	0	0
Dalali (commission paid to petty broker) at 4 annas per cent of purchase price	6	8	0
Measuring charges at 6 pies per bag ...	6	4	0
Gunny bags, rate Rs. 50 per 100, may be used 4 times $\frac{50 \times 2}{4}$	25	0	0
Cartage to station at 9 pies per bag	9	6	0
Coolies at 4½ pies per bag	4	11	0
Twine and sewing at 1½ pies per bag ...	1	9	0
Dharmada (charity payable to a Hindu society for distribution to poor) at 1½ pies	1	9	0
Goshala (charity payable to cow protection society) at 1½ pies	1	9	0
Arranging bags on station at 1½ pies per bag ...	1	9	0
Adat (commission) payable to Raipur commission agent who advances the cash for the purchase and arranges for the forwarding, at Re. 1 per cent	26	0	0
Railway freight on 200 bags (one wagon), 505 maunds at 6 annas 8 pies per maund	210	6	8
Nagpur Town duty at 6 pies per maund ...	15	12	3
Nagpur station unloading at 8 annas per 100 ...	1	0	0
Cartage to warehouse at 1 anna per bag ...	12	8	0
Rent of warehouse, servants, etc., chargeable to this amount of grain (roughly estimated)	10	0	0
Travel to Raipur (the ordinary merchant generally buys about two wagons at a time). Half cost of travel charged...	5	0	0
Total cost to wholesale merchant ...	2,938	11	11
Wholesale rate of sale of this grain would be 5¾ *pailis* to rupee or Rs. 30-8-0 per *khandi* for 100 *khandis*	3,050	0	0
Adat (commission) charged to retailer in addition to purchase price at 6 pies per bag	6	4	0
Total received by wholesale merchant ...	3,056	4	0
Total paid by wholesale merchant ...	2,938	11	11
Profit on transaction ...	117	8	1

Profit divided by amount paid = 3·98 per cent net profit on turnover.

This figure should be taken as the average, but in actual practice the profits vary greatly according to the condition of the selling market. For instance, if the Nagpur wholesale rates should fall from 5¾ *pailis* to 5¼ *pailis* per rupee he would make a small loss, whereas if it should rise to 5 *pailis* per rupee the profit would be substantial.

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Thus it can be seen that on a rising market the wholesaler is able to make very considerable profits, while on a falling market he may easily suffer a heavy loss.

	Rs.	a.	p.
Price paid by retail merchant at 5¼ *pailis* per rupee, Rs. 30-8-0 per *khandi* for 100 *khandis* ...	3,050	0	0
Adat (commission) paid to wholesaler, in addition to purchase price, at 6 pies per bag ...	6	4	0
Measuring charges at 1 *paili* per *khandi* (1/160) ...	19	1	0
Gunny bags at 2 annas per bag	25	0	0
Cartage at 1 anna per bag	12	8	0
Twine at 1½ pies per bag	1	9	0
Sewing at 3 pies per bag	3	2	0
Dharmada at 3 pies per bag	3	2	0
Rent, lighting and miscellaneous (roughly estimated) ...	10	0	0
Total cost to retail merchant ...	3,130	10	0
Retail rate of sale of this grain would be 5 *pailis* per rupee or Rs. 32 per *khandi* for 100 *khandis* ...	3,200	0	0
Total amount received by retailer	3,200	0	0
Total amount paid by retailer	3,130	10	0
Profit on transaction ...	69	6	0

Profit divided by amount paid = 2·22 per cent net profit on turnover.

Surprising as this figure may seem, I feel certain that it represents the approximate *nominal* profit taken by the average retailer. It is obvious that he could not afford to run his shop on the basis of 2¼ per cent profit on turnover. I doubt if anything less than 10 per cent could keep him going. The difference between 2¼ and 10 per cent must be made up in other ways. Some of these are—

(1) Selling on credit. The ordinary rate of interest charged to the working classes in Nagpur is one anna in the rupee per month (6¼ per cent per month).

(2) Mixing two qualities of grain. It is not difficult to mix two qualities in such a way that the resultant mixture seems to be consideraoly better than the average of the two. This is done to such an extent that it is difficult to get unmixed grain from a retail shop in Nagpur.

(3) Short measures. It is a common complaint that the measures used by retail merchants are frequently smaller than the standard measure. It is also quite possible for a clever man to cheat in several other ways while measuring.

(4) Adulteration of grain by other seeds and dirt. I do not believe that this is done to any great extent in Nagpur.

In addition to the above, there is often another pair of hands through which the grain passes before reaching the ultimate consumer. Grain is frequently purchased from the retailer by petty vendors who go from door to door and to places some distance from any shop. Their profits are probably not large—slightly more, perhaps, than they could earn at day labour.

It is difficult to offer any further suggestions as to the improvement of the existing system, other than those mentioned in connection with the *ganj* and the standardisation of measures on a basis of seers and maunds. The only radical improvement possible would be to eliminate private enterprise entirely by developing a system which would enable producers to deal directly with consumers through co-operative agencies. I will show below how one half of such a system has already been developed in Nagpur and how I believe that it can be made complete.

For a number of years the Empress Mills had been supplying grain to its work people at considerably below cost. In 1924 this concession was withdrawn, certain adjustments having been made in salaries by way of compensation. But the mil hands had become accustomed to receive part of their pay in advance in the form o

grain and foodstuffs, as well as to get unmixed grain and full measure. At that time the Y. M. C. A. was asked to devise some scheme whereby those advantages could be retained at little or no cost to the mills.

The Empress Mills Co-operative Stores, Limited, was organised and registered under the Co-operative Act. Shares, were fixed at Rs. 5 each and can be purchased only by mill employees and the Y. M. C. A. Welfare Work staff. The Committee of Management consists of seven men, three elected by the general meeting of members, three nominated by the Manager of the Empress Mills and one nominated by the Y. M. C. A. Such a large representation was given to the management of the mills on account of the loans which they give to the Stores from time to time. From a banking point of view, these loans are not fully secured, though all the stock is kept inside the mill compound.

The Stores were opened on the 1st of October 1924 and have grown steadily in popularity and prosperity since that time. During the first month, the sales were only Rs. 7,000. For the past three or four months, the sales have been well over Rs. 25,000. During the first nine months the profits were some Rs. 7,000 though the Stores received assistance from the mills in many ways. For the next 12 months ending in June 1926, the profits were nearly Rs. 10,000 and the help from the mills was much reduced. 5½ per cent interest was paid to the mills on loans received. It is anticipated that profits will be considerably increased this year, as we are now purchasing less from wholesale merchants and more in the *ganjes*.

Actual paid-up share capital is only some Rs. 5,000 but shares are being sold every day. Interest on shares is paid at the rate of 6½ per cent and in addition to this a rebate of 6¼ per cent is paid on all purchases by members. Reserve funds are being built up considerably in excess of the amount required by the Co-operative Act. There is no reason why the Stores should not continue to grow in prosperity and service to its members, provided that the buying of grain is done intelligently. Both the selling and buying of such a large quantity of grain present difficulties, but these are being solved gradually.

I have shown that one half of the problem of marketing grain can be and is being done by co-operative methods. The consumers of the Empress Mills are organised in such a way that they can buy direct from the producers of grain. The next step would be so to organise the producers that they could deal collectively with the Co-operative Stores and others. This, I believe, could be done in conjunction with the already existing co-operative credit societies.

I will outline the scheme only briefly, since it has not yet been tried in any grain area in the Province, though it is under consideration. The primary credit society in the village would collect the grain of its members, either given in repayment of loans or the ordinary surplus for sale. This grain would be handed over to a sale society in some central place, where it would be properly graded. This sale society would be a department of, or at least work in close connection with, a Central Co-operative Bank. Upon receipt of the grain, the Central Bank could credit the local society with some 75 per cent of the estimated value of the grain.

The grain could be sold at once or held for a rise in the market and the selling strength of the producers thus organised would be considerably greater than it is with each one coming individually to the *ganj*. The Empress Mills Co-operative Stores, Limited, could be counted on to offer a fair price for such grain. The saving to our Stores would be considerable since we could purchase in this way as much grain in a day or two as we could ordinarily purchase in the *ganj* in two or three weeks.

Such a scheme is not impossible. One can easily point out many difficulties, particularly psychological ones. But I feel that it will be easier to start and easier to manage than co-operative credit societies. The ground has already been broken for co-operative effort by the credit societies. It is essential that the Agricultural and Co-operative Departments of Government work together if anything is to be done along these lines.

I do not suggest that there is anything new in this scheme for producers' co-operative societies. I do feel, however, that it is somewhat simpler than the usual scheme and that the presence in Nagpur of a well established consumers' society gives additional hopes for success.

I wish to acknowledge the assistance given me by Mr. D. G. Bapat, Manager of the Empress Mills Co-operative Stores, Limited, in securing many of the figures given in this statement.

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Oral Evidence.

32355. *The Chairman:* Mr. Peterson, you are Secretary of the Y. M. C. A., and you are President of the Empress Mills Co-operative Stores, Limited?—Yes.

32356. We are much obliged to you for the note of evidence which you have put in. Would you like to add anything to it in the nature of a statement at this stage?—There are one or two things which I would like to point out. On page 442, I have shown the weight in tolas, nominal and actual. It should be understood of course that the weight of grain in the *paili* measure varies according to the quality of the grain. These are only comparative figures. If you put one sort of grain into that *paili*, it may weigh 105 tolas, but if you put another sort of grain, it may weigh more or less; these are only comparative figures.

32357. That is the capacity of the measure for the average quality of grain?—Yes, this is for the average quality of grain.

32358. Is it your experience that, as a rule, the *dalal*, if he has any bias, is more in sympathy with the buyer than with the seller?—That has been my experience as a rule, but I have learnt that it does not always happen. You will notice that I have mentioned in one place in my statement that the Nagpur *ganj* was closed for a week on account of false measures. This is a question of measures, not necessarily of *dalals* but the *ganj* was closed by the purchasers, because of false measures which were given.

32359. False measures in favour of which party?—In favour of the producer, the man who brought the grain.

32360. That looks as though the *dalal* was in favour of the cultivator?—Yes.

32361. Do you think that the market would have been closed as readily if the advantage had been in the other direction?—I think it is very doubtful. On the other hand, I visited a *ganj* yesterday in which there are no *dalals*, and a very large number of cultivators go there with their grain because there are no *dalals*. It is in a small village in the Bhandara district called Lakhni. It is not supervised by any one in particular; there are no *dalals* and no deductions of the usual sort are made. The grain is not spread out, as in the *ganj* here and in most *ganjes*; it is sold from the cart. The cart is quite deep and long, and the only grain which the purchaser can see is a little bit at the front and at the top, and the cartman refuses to empty it out; he does his own measuring for you. So that in this particular *ganj* everything is in favour of the cartman, the producer, and not of the purchaser. As a result of this, the prices are very low, so that it comes to the same thing in the long run.

32362. The purchaser is protecting himself?—Yes, he is protecting himself by very low rates.

32363. In the grain markets and in the municipal markets, it appears that the *dalals* are licensed?—As far as I know they are licensed in all these *ganjes*.

32364. Have you anything to say as to the manner in which the qualifications of applicants are scrutinised?—I have no information on that subject.

32365. Have you any views as to the fitness, or the reverse, of the average *dalal* for this measure of public trust?—I should think that the type of *dalal* is probably as good as you can get under the circumstances.

32366. You suggest two ways of improving the existing system of marketing. The first is the standardisation of weights and measures. How long have you been in India?—I have been in India for 10½ years, but I have not always been connected with work of this sort. I have actually had 2½ years' experience at this particular sort of work.

32367. Have you formed any view as to the practicability of this suggestion of yours that weights and measures should be standardised? Do you think that public opinion would accept it?—I think I can speak on behalf of the wholesale dealer. I have questioned quite a number of them, both in Nagpur and elsewhere, and I have found not one as yet who would object to standardisation.

32368. From what quarter, or quarters, do you think opposition would come to such a proposal?—It would come chiefly from the people who are at present doing the measuring, I should think the coolies about the *ganj*. I do not believe much t

objection would be raised by any one else, except that it is a very old and traditional form of measuring. Conservatism might be against it, but I believe that the wholesale merchants would welcome it.

32369. Do you think they would also welcome the change from volume to weight?—That is the particular question I have asked them; they are willing to do that.

32370. That does not necessarily mean the same thing as standardisation of weights and measures? That is the first step?—I took your first question to mean that.

32371. You think that a proposal to standardise weights and measures as such would also be well received?—It would be well received by the merchants dealing in larger quantities. I do not believe that the dealer in small quantities would like to make any sort of change.

32372. Because they are accustomed to this?—Yes, and they are content, but the merchants dealing in larger quantities in several places would welcome any sort of scheme for standardisation.

32373. Could you give instances of the complications and irregularities of the existing system?—It is difficult to form any idea as to what the prices actually are, when we deal with outside places. We get a telegram saying that the price of a commodity has gone down, but unless we have accurate figures as to what their measures are, it is impossible to say what the price is.

32374. You point out that the existing practices place a premium upon dishonest dealing?—Yes, distinctly so.

32375. You are associated with a wholesale firm, the Empress Mills?—My connection is this: the Y. M. C. A. is conducting the welfare work on behalf of the Empress Mills.

32376. Your suggestion is that the *dalal* should be dispensed with altogether and that the cultivators' grain should be sold by auction?—Yes.

32377. Have you considered the effect of that on the amount of time that it would take to pass a given quantity of grain through the market?—That had not occurred to me, because, where it is done by auction, the process is a very rapid one. The whole auction can easily be done within 5 minutes, and sometimes less. The auction of one pile of grain will certainly take not more than 5 minutes.

32378. You see no reason why the whole business of the market should not be conducted on the basis of auction?—None at all. I want to make it clear that it is not an auction of the whole supply of grain in that *ganj* at one time, such as they have in some of the cotton markets; each lot should be auctioned separately.

32379. It is not a question of settling the general price?—No. I do not think that is possible for grain.

32380. Have you ever discussed this proposal with persons interested in the trade?—I have discussed it in Raipur with one of the large grain merchants, who is also the President of the Municipality, and he is considering the adoption of this scheme in the Raipur *ganj*. At present in the grain *ganj* in Raipur, all the sales are done privately, arranged by the *dalal*; there is no auction.

32381. You give us a very interesting analysis of the total market charges. May we take it that these represent a fair average for running such a *ganj*?—No; I should say they should be considered as mere speculation on my part. I have no figures as to the cost of running a *ganj*.

32382. What about the figures on page 444, from the purchase price of 200 bags of medium quality rice in Raipur *ganj* and taking the whole of that transaction down to the end of the wholesale stage?—These figures should be taken as typical of an average purchase and shipment and sale of grain, as worked out from our actual figures. The former figures about the cost of running a *ganj* are merely speculative, but these figures are based on our actual accounts. They do not represent any particular purchase that we have made, but are a sort of average.

32383. You show at the end of the transaction a profit of Rs. 117-8-1?—Yes.

32384. Is that the gross profit?—Yes. I have taken out of the total one or two items, such as the cost of the merchant's journey to Raipur, the rent of his warehouse, salaries of servants, etc. I believe these figures represent, as accurately as is possible, the cost of the whole transaction.

32385. Then you point out that on a rising market the wholesaler is able to make very considerable profits, while on a falling market he may suffer a heavy loss. In your experience, which branch of the distributive trade usually gets to hear of a prospective fall first?—The wholesale dealer.

32386. Are they very often left to carry a loss?—More often than one would suspect; the retailers follow the wholesale prices very closely. Our co-operative stores have suffered loss time and again, and at other times have made a somewhat inordinate profit.

32387. Then you take us to the relations between the retailer and the consumer, and you show the retailer makes the extraordinarily low nominal profit of about 2¼ per cent on turnover. You rightly point out that no retail business could be conducted on that margin. Turning to the figures you give at the top of page 445 the total amount paid to the wholesaler by the retailer is Rs. 3,130-10-0 and the total amount received by the retailer from the consumer is Rs. 3,200?—Yes, except that the amount paid represents not only the amount paid to the wholesaler but other charges, some of which are paid to coolies and so on. It is the total cost.

32388. It is the amount paid to the wholesaler, *plus* these incidental charges?—Yes.

32389. Then you explain the mystery by giving a list of practices which, for the most part, are improper?—Yes.

32390. Are you convinced that those practices really afford the explanation of how the retailer makes a living on this apparent margin?—These are certainly the chief means used by retailers to increase their profits. There may be others I have not yet discovered.

32391. The general suggestion you make is that there should be a tightening up of the control over markets. You could not achieve the change from the present practice to that of auction without some control?—The question of standardising and fixing weights must certainly be taken up by Government; no one else can do that. I am not prepared to say Government should step in and compel people to sell in one way or another.

32392. The municipal committee, or whatever body controls the market, must agree to this change?—Yes.

32393. Do you think the cultivator is represented at all on the average market committee?—I have no information on that point.

32394. Can you think of anyone on the municipal market committee here who could fairly be said to represent the cultivator?—As a matter of fact, I do not even know one member of it.

32395. The Commission had this morning the opportunity of seeing your consumers' retail co-operative society which you describe in your note. Have you a committee of consumers to help you to manage that society?—We have only one committee in our stores, made up as follows: 3 members elected by the members of the society (all of whom are consumers), 3 members nominated by the manager of the Empress Mills and one member nominated by the Y. M. C. A. The quorum is so arranged that *no* business can be transacted unless at least one mill hand is present.

32396. Could you give us an idea of the wages of the mill hand members?—All three of them are in the superior (not the managerial) grade. One is a clerk in the office, getting about Rs. 45, and the other two would earn about the same amount. They are leaders amongst the men, men of standing in the mills and were chosen entirely by the mill hands, who were not influenced in any way by the management. The men have, as a matter of fact, chosen extremely good representatives. All three know a good deal about the grain business.

32397. Then you make a suggestion as to the manner in which consumers' co-operative societies might link up with producers' societies. Do you think there is a conflict of interest between the two?—I am not an expert on the subject, but it seems to me commonsense to believe there is bound to be some conflict.

32398. One is anxious to sell as dear and the other to buy as cheap as possible?—Yes. I understand the International Labour Office has made a study of this question; I have just received their report on it, which I have not yet had time to read. It is evidently recognised as a serious problem elsewhere.

32399. Where do you get your grain from?—Most of our rice comes from the Chhattisgarh Division. We buy a large percentage of it in Raipur. Wheat comes from almost anywhere round Nagpur; we do not have to go far from Nagpur for wheat. As far as possible we send our own purchaser to the *ganj*; he picks out the grain he wishes to buy and arranges with the local commission agent to pay for it, take charge of it and ship it to Nagpur. The commission agent then sends us a *hundi* covering the amount.

32400. Do any cultivators bring their grain direct to you?—Not as yet.

32401. Would you encourage that?—We would be only too glad if they did it but I do not think it is very likely unless we open a purchasing shop in the part of the city to which they ordinarily come.

32402. Have you any organisation for promoting thrift amongst your members?—Not as yet.

32403. *Mr. Calvert:* Have you come across instances where the rate quoted has been a false one, such as where Rs. 3 a maund is quoted, but that maund is 42 seers instead of 40?—The Nagpur unit is the *khandi*, which is approximately 5 maunds. At Bhandara, however, they also use the *khandi*, but it is of a different size. Is that what you mean?

32404. Do you have cases where the seller does not know what the actual *khandi* is, he thinking it to be one thing and it actually being another?—That is likely to happen if he does not know the measurement of the unit used at a particular place. You cannot make a comparative list of prices by showing so much a *khandi* in Raipur and other places; you must first transpose the various *khandis* into some standard measure.

32405. Some men may quote Rs. 3 a *khandi* and some Rs. 3-1-0; are there cases where a man will sell at Rs. 3-1-0 and then find the *khandi* quoted for is different from the other?—In comparing prices in different parts of the Province it is necessary to know the local *khandi* used, but here in Nagpur only one *khandi* is used. It may vary according to the way it is measured, but there is only one standard for Nagpur.

32406. Is that strictly adhered to?—Nominally. There may be cheating at the time of measurement; that is all.

32407. We find a maund varies according to whether a man is buying or selling; it may be 35 seers in the one case and 42 in the other. Do you come across cases like that?—If you are referring to false measures, you will find plenty of those in Nagpur; but in any *ganj* controlled by the Municipality the measure used must have the municipal stamp on it, so that the actual measure used is not false, though no process of measuring can be guaranteed to be accurate if a clever man is using it. Of course, the process of measurement is not a difficult thing; the actual measurement is nothing if you have a clever man doing the business.

32408. Have you carried your investigations into the actual weights used in any market?—These are given here on page 442.

32409. About the actual measure of weight, not your standard weight?—We do not use the standard weight at all; the unit is always one of quantity and not of weight; I have not looked into the question of weight at all.

32410. On page 445 with regard to the means whereby the retailer increases his income, do those relate to a shop in a town dealing with mill hands?—I was thinking of the ordinary shop in Nagpur and of course a very large percentage of the population in Nagpur is connected with mills.

32411. You have not really carried your investigation into shops dealing with ordinary cottage workers?—No; it is based on Nagpur experience.

32412. Do you know anything at all about the condition of cottage workers marketing their produce?—No; I have not gone into that.

32413. *Sir Henry Lawrence*: Is there any machinery for examining the weights and measures which are in use in the Municipality?—As regards weights I am not able to give any information; but the measures used in grain bazars have a municipal stamp. They are made according to certain instructions and a municipal stamp is put on them and these official measures must be used in the *ganjes* and in the markets controlled by the Municipality.

32414. Is there any means of tampering with them?—You cannot easily do it, because they are curved up a little bit at the bottom and it is very difficult to tamper with them. The measure gets smaller towards the top than at the bottom. It is said that they can put up false bottoms but I think it is somewhat difficult to do so I do not think the municipal measures are tampered with; but there is no law that a merchant in his own shop should use municipal measures.

32415. Do you advocate such a law?—I think it would be a very good thing; all measures used in measuring grains should be municipal measures.

32416. Have you any annual inspection of weights and measures enforced by law?—There may be a law; but I know it is certainly not enforced.

32417. *Sir S. M. Chitnavis*: There is a Market Overseer?—Yes. But I know that the ordinary shop does not use the municipal measure, or, if it does, it will have a spare measure to use when the shopkeeper thinks that the customer does not know the difference.

32418. *Sir Ganga Ram*: You say that the grain is brought as far as 100 miles; are there no *ganjes* within these 100 miles?—There are parts of the Province where there are no *ganjes* for 100 miles.

32419. Are there really no *ganjes*?—I have no definite information.

32420. What do you think carting 100 miles would cost them?—I have no idea.

32421. Roughly, how much a maund would the carter charge?—I am afraid I could not furnish you with a figure of that sort.

32422. How would you auction? Per maund, per heap or per bale?—If the maund is taken as the standard measure then the auctioning would be done at so many rupees, annas and pies per maund.

32423. You do not auction the heap?—No.

32424. *The Chairman*: I think you were definitely of opinion that the measurement should be one of weight?—Yes; but the auction should be done, no matter what the standard is. I am definitely of opinion that measures of weight rather than of quantity should be used; but there is no way to auction a heap for so much when you do not know what is in the heap.

(The witness withdrew.)

Rao Sahib G. N. SAHASRABUDHE, Pleader, Ellichpur, Amraoti District.

Replies to the Questionnaire.

Introduction.—I am a pleader practising in the Courts at Ellichpur for the past 42 years. During the course of my profession I came across many *Kunbi* clients who generally form a major portion of the litigant population. I am watching their condition and the condition of their lands in Berar. I was a Vice-Chairman of Ellichpur Civil Station Municipal Committee for 18 years and I was Honorary Secretary of the same for 8 years. As Vice-Chairman, I had connection with primary and secondary education and I was a Manager of the High School at Ellichpur which was opened there by the Municipal Committee on 1st of July 1914.

I was President of the Board of Directors of the Berar Match Manufacturing Company, Ltd, started in 1908.

I appeared as a witness before (1) the Indian Industrial Commission, (2) the Fiscal Commission, and (3) the Indian Taxation Enquiry Committee, and I had submitted replies to the questionnaire issued by the Indian Economic Enquiry Committee but was not examined for want of time.

I am myself an owner of some lands at Kandli and I have planted about 350 grafted mango trees long ago.

While studying agriculture I have formed an opinion that Government officers, (1) Lord Curzon, (2) Professor Voelcker, (3) Lord Willingdon, (4) Sir James MacKenna, (5) Dr. Clouston, (6) Sir Frank Sly, and others have performed good services to the country but there is still left ample scope for improvement in agriculture. It is hoped now that the further progress in agriculture will result in practical benefits to cultivators, so that they will be free from indebtedness and will receive increased production. When this will be accomplished there will be a really happy and contented rural population.

My proposed scheme will indeed create cheerfulness and activity all round amongst village people.

In short, it is desirable that India should not lag behind all civilised nations of the world in all branches of Administration under British rule.

QUESTION 1.—RESEARCH.—The question of bettering the co-ordination between the several Governments in India and the Government of India is a comprehensive one and might concern all departments in India. But it seems that I should confine my remarks regarding research to provincial research work alone.

The Government of India has already appointed an Agricultural Adviser to the Government of India who controls and supervises the work of provincial research or experimental officers.

But the general feeling amongst the provincial officers seems to be that they are independent officers and that their provincial work should not be interfered with by any superior officer. Every provincial department wishes that they should be independent and that they will do what they think fit suitable to the special conditions of the Province. Similarly in the case of the Veterinary Department, the necessary serum is prepared at the Muktesar Institute probably from the hill cattle and is forwarded to the Veterinary Officer at Nagpur or Amraoti.

When the provincial reports are received at the Pusa or the Muktesar Institute, all reports should be examined at Pusa and the results compared with the Pusa Research Institute. Afterwards a meeting should be convened at Pusa to which all provincial officers, agricultural and veterinary, should be called to attend the meeting. A free and full discussion should take place on all reports and conclusions arrived at, with the consent of all officers. A consolidated report should be submitted to the Government of India and orders should be issued accordingly. This procedure will improve matters and relations and the Government of India should help to carry out these suggestions.

In this case there will be no necessity of forming any Board for this purpose.

There are already Superintendents appointed in the Veterinary Department and here is no necessity of retaining an advisory veterinary officer.

Independence of Provincial Governments and officers should be retained, subject o the control and direction of the Government of India in urgent cases only.

The Research Institute at Pusa is rendering excellent services to the country and should be developed as far as possible.

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QUESTION 2.—AGRICULTURAL EDUCATION.—(i) The agriculturists in Berar were simple in habits and living, and foodstuffs of daily use and other articles were cheaper and therefore they used to maintain themselves easily in old days. But dazzled by the Western civilisation they became extravagant, the cost of living was increased owing to the Great War and they are now reduced to a miserable condition. Productive power of the land was not increased along with the increased expenditure and consequently they have fallen into heavy indebtedness.

These conditions were observed by Professor Voelcker. The necessity of imparting scientific education was emphasised. Lord Willingdon, the late Governor of Bombay, in his opening address delivered in the Agricultural Conference held at Poona in 1917 also spoke in the same strain which shows the nature of education to be imparted in the schools. So that the question of agricultural education was before the Government of India for the last twenty years but nothing substantial was done in the matter. From the table on page 455 it will be seen that out of the whole agricultural population only 380 were receiving agricultural education in six schools in the whole of British India.

(ii) It is hoped now that something will be done and the Government of India will be pleased to establish as many schools as possible and encourage the establishment of compulsory primary schools by allotting substantial contributions and subscriptions to the District Boards and Municipal Committees and thus encourage education without any further delay. There are ample funds in Berar, land revenue itself amounts to Rs. 91,0 ,000, out of which only Rs. 6 lakhs are spent by the Agricultural Department. Giving contribution as usual to the Central Government the balance may be utilised by Government for the good of the Province of Berar alone.

(iii) For the establishment of agricultural vernacular middle schools it is necessary—

(*a*) That the curriculum of the primary schools of general education must be embodied so as to include some teaching which will create agricultural and industrial bias in the minds of boys, and

(*b*) that gardening should be taught. A small plot should be given by Boards for use of boys made to work actually in the garden just like coolies.

One Mr. Shanker Laxman Vaidya of Poona, who is a Professor in the Poona Training College, has written a book on gardening which would make a good text-book and should be introduced in the curriculum by the department.

(*c*) The curriculum of the Loni school is an excellent one which will train the sons of a landlord into a good practical man able to manage his own lands. But competent teachers will be required to teach the subject. No such teachers will be available for the present. The gricultural College may provide some teachers, if necessary, but even after coming out of the college the students must have some practical course for one year when the instruction must be given in vernacular because they shall have to teach boys of the agricultural school in vernacular. The boys do not know English. Entrance qualification is only the passing of the 4th vernacular standard. These schools should be under the control of the Minister for Agriculture. A special Agricultural Inspector should be appointed to inspect the schools. The schools should not be placed under the control of the Director of Public Instruction.

(iv) As there is a Training College at Akola and another at Amraoti in Berar where teachers for the primary schools are prepared, so there must be established at least one agricultural training school in Berar which should train teachers, who should be competent to teach the students of the vernacular middle agricultural schools.

A model agricultural school was exhibited in the Poona Agricultural Show which deserves consideration.

(v) In Berar there are at present no schools of agriculture worth mentioning. There are primary schools opened in villages by Boards which are attended by *Kunbi* boys but the general tendency is to avoid going to school.

(vi) As Vice-Chairman of the Ellichpur Civil Station Municipal Committee, I was a manager of the primary school and the Anglo-vernacular high school at Paratwada. Last year I paid casual visits to some of the Government and Board schools in Ellichpur and Daryapur taluks. My object was to see whether any attempt is made in the school to create an industrial or agricultural bias in the minds of young boys. But it is regrettable to note that no such attempt is made. I had a good deal of discusssion

with masters but they said no value is attached to this sort of education by their superior authorities and hence no attention is paid by them. From my experience I think that educational authorities do not pay much attention to industrial or agricultural education.

The rural people may be made to take interest in education (1) by being shown successful demonstration by which they will be profited or their production per acre will be increased, (2) by being given the advantages of education, (3) by their knowledge being kept intact until they attain 18 years and thus become educated electorates, (4) interesting books in a library or reading room being read out to them, (5) by constant touch with agricultural officers, one of whom at least should go in the village and mix with them freely, and (6) by being brought in contact with educated people of their own caste who should be models before them. In short they must be in touch with educated people who should always live in the villages. I visited many villages and I found them always in despondency and disappointment with no merrymaking or any common sports or amusements.

I have therefore suggested a change in the organisation of the department as shown in the diagram in Appendix XI* attached herewith in which I have attempted to show at a glance all that is needed by an agriculturist. Everything is at his door. The agricultural agent has his residence with all his manures and implements, all these primary schools, agricultural schools, dispensary, veterinary dispensary, police station, demonstration farm, etc.

If my proposal is carried out, agricultural officers will be always going there. Also the Deputy Commissioner, Commissioner, Tahsildar, School Inspectors, Director of Public Instruction, etc. Even the Minister for Agriculture and Education and His Excellency the Governor might one day pay a flying visit to the village. I have selected Pathrot, a village of 6,000 souls with good lands approachable even by motor even in a rainy season. Another place is Deurwada, some distance from Chandur Bazar. I have purposely selected this village which has got a good sacred river—Purna—a complete village scene and life. Roads are village roads and will require repairs. Officers may go casually by riding on their horses and ponies. There would be no motors which though good and speedy are making people lazy. Walking has become tiresome to them which is not a good sign. There are 20 buildings to be erected but they should be built model houses and no costly buildings are required. Lands of farmers themselves are taken up by Government for demonstration purposes on certain conditions and they should be convinced of the successful working of methods of profitable production when they are sure to adopt them. This is the way to improve agriculture and make the people to take an interest in education and to be happy and contented. I will add more buildings for the office of the village. Co-operative credit societies would advance money at a small rate of interest. Unless something attractive is done, no improvement will take place.

At first an experiment may be made in two villages of each taluk. Kapustalni and Pandhri near Anjangaon may be selected in Daryapur taluk. There are 22 taluks in Berar but one or two villages only may be taken first in the whole of Berar.

The Compulsory Education Act is passed by the Central Provinces Council and is in force in Berar. Some schools of this kind have been opened in Berar, but the attendance of boys is not yet satisfactory. I examined the compulsory educational schools opened at Karajgaon and Shirajgaon in Ellichpur taluk and at Itki in Daryapur taluk in December 1925. They have been financed by the District Board and some of them are in good condition. On enquiry I found that the objection of the people to send their boys to schools is that they lose their wages and thus they are put to pecuniary loss. I thought over this question and I propose the following amendments:—

(1) That the admission age should be raised from 6 to 11 to 10 to 13, both inclusive.

(2) That the school should be held only in the morning from 7 to 10 a. m.

(3) That four Sundays in the month and on all Hindu holidays the school should be closed.

(4) That the school should be closed from 15th November to 15th March for *hangam* season when the boys get good wages.

(5) No vacation for hot season allowed but boys should attend school from 3 to 6 p.m.

(6) In these primary schools only the 3 R's and writing of their own signature should be taught.

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*Not printed.

By this system boys will attend the school and will as well get their wages. All the people will be satisfied.

That libraries and reading rooms should be established in villages. Government help is necessary.

The following table will show the number of agricultural vernacular middle schools in the different Provinces of India* :—

Name of the Provinces.	Institutions.	Scholars.
1. Madras	2	44
2. Bombay	5	134
3. Bengal	2	56
4. United Provinces	1	33
5. Bihar and Orissa	1	79
6. Central Provinces	2†	34
Total ...	13	380

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—Experimental and demostration farms in Berar.

There is one experimental farm at Akola and two demonstration farms, one at Yeotmal and the other at Basim. One seed farm is at Boregaon. There is one cattle-breeding farm at Boregaon. It is doubtful whether these farms can be carried on on a commercial basis. As for experimental farms, it must be admitted that they are just like laboratories and they cannot be carried on profitably. But demonstration farms in which demonstrations are made of these methods only which have proved successful in the experimental farms may be carried on on commercial basis. Otherwise the Indian cultivators will not follow them and the money will be uselessly spent. This question was discussed in the Conference of the Board of Agriculture held at Bangalore in 1924.

The Maharaja of Mysore and Dr. Clouston are also of the opinion that the "financial aspect of these farms is a secondary consideration. They are like field laboratories." If this is the case we cannot expect ignorant *Kunbis* to follow the methods demonstrated on the demonstration farm.

So the question of bearing the burden of these farms is worth consideration. I wish the department will submit to the Commission any statistics that may be in its office which will show the effectiveness of these farms to the farmers and showing the number of people who have actually taken advantage of the methods and benefited themselves accordingly. If such statistics are not forthcoming, then it is difficult to say how far the money spent on these demonstration farms has been spent for the benefit of the Indian cultivators. If these farms are useful in some other way, of course they may be continued. In the Bombay Presidency, the Deputy Director of Agriculture of the Nasik Division reports that in one demonstration farm in his charge the expenditure incurred was Rs. 51,000 and the income derived was Rs. 58,000. Such figures should be shown in the reports of the demonstration farms in Berar.

I do not know of any measures that will make the farms successful. In my opinion, they are not profitable and the department ought to be in a position to show the effectiveness of these farms on the minds of the rural people. If statistics of effectiveness are maintained, they will throw some light on the subject.

*Please see Quinquennial Report on Education for 1917 to 1921, page 163.

†One school has been closed recently.

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Valuable resolutions are passed in conferences of the Board of Agriculture, etc., but they being in English are of no avail to rural people. These resolutions are not brought into action and the people do not know anything of them and they are of no use to rural population. They are useful to departmental officers and other English-knowing people. The question arises of what practical use are these conferences to Indian farmers. Conferences are held at a great cost of hundreds of thousands of rupees per year. Most of the resolutions passed are a dead letter. Huge reports are printed and published in the country and this too at a great cost. It is not known why Government of India did not take any action on the resolutions passed in these conferences. I request the honourable members of the Commission to think over this matter. Merely passing resolutions will not give supply of manures to poor agriculturists at a cheap rate in their villages nor will they be improved by the apathy of Governmen in this respect.

The same is the case with the departmental resolutions. All of them are no translated into vernacular and not freely distributed amongst the villagers gratis. Departmental officers should understand that they are teachers of methods of cultivation and other methods of rural people who do not know English at all and whose language is Marathi, Urdu, Telugu, Kanarese, etc., so that unless books and pamphlets are translated freely and distributed gratis how do they expect them to learn new knowledge for them. I do not mean to say no distribution and translation is made at all but what is done is insufficient looking to the number and extent of the rural people in Berar and in other villages of India. Propaganda work is generally the most important work to be done by the Agricultural Assistant and other officers.

Sir James MacKenna's Review of the decade is very useful. At least in the last pages of the Review he has passed the following remarks :—

"Let the motto of the department be Sympathy and Co-operation."

"Its one great aim being to work with the people and for the people and for the people's good."

The above sentences contain the real policy of the department.

English and American methods of propaganda work are praiseworthy. I received 52 agricultural pamphlets from the United States Department of Agriculture gratis. But that department spent about one rupee postal charges. The pamphlets are valuable and interesting. This shows that American Department of Agriculture is generous enough to do propaganda work even in foreign countries.

This English and American ideal should be followed in India.

I appreciate the propaganda work done by the Central Provinces and Berar Agricultural Department. Mr. Allan, the officiating Director of Agriculture, is entitled to many thanks from Berar farmers for arranging a special train on concession rates for conveying Berar agriculturists to Poona Exhibition which was the greatest exhibition ever held in India.

My thanks are due to the department for kindly distributing at Badnera railway station my 700 industrial pamphlets gratis to all Berar agriculturists that went in the special to see the Poona Exhibition.

QUESTION 4.—ADMINISTRATION.—This is an important question, for the condition of the Indian agriculturist depends upon the way in which the question is solved. The question is whether the Indian farmers are satisfied with the present agricultural services. At the outset I rely on the following quotation from the report on the "Introduction of improvements in Indian agriculture". The quotation is, I think, most important and should be borne in mind while working the department. It runs thus :—

"The essential difference between the agricultural departments in the East and in the West is that the latter have arisen to meet the spontaneous demand of cultivators of the soil, whereas the former have lately been created by a bureaucratic Government anxious to give all assistance it can to its agricultural subjects. The demand for improved agriculture has not in India, except in special cases come from the cultivator. While therefore in the West the cultivator is naturally in direct touch with the Department of Agriculture, in India it is necessary for the department to put forth every effort first to ascertain the needs of the cultivators and then to demonstrate how they can most effectively be met".

Any circular issued by the head of the department must be so framed as to meet the above conditions. The methods and arrangements followed in the West are of us use in the East on account of differences in tendencies and mentalities of the farmers.

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The above view was the guiding spirit of the report published in 1892 and this view was before the first Viceroy who established agricultural departments in India in 1905. I do not know what organisation circulars were issued by Government for the guidance of the departmental officers in working out the department. The first circular that I came to know was issued by the department in the Central Provinces in 1922. I have read the circular very carefully and it embodies some spirit and the object contained in the above quotation. A review of agricultural operations during the decade from 1905 to 1916 has also been published. It contains the real progress made during that decade. By reading it one is impressed that the achievement of the Agricultural Department seems to be (1) distribution of good seed of various crops through agricultural associations, (2) distribution of improved implements, and (3) teaching of various new crops for production.

The above achievements are in some ways satisfactory. But they are insufficient considering the period and amount of money spent on it. Experimental and demonstration farms have done some good, but as regards scientific production of increased crops nothing important seems to have been achieved. Speaking for Berar, I can say that poor *Kunbis* are cultivating their ancestral lands by their traditional methods and implements and produce just sufficient for the maintenance of their family. But now the times are changed. Foodstuffs and clothes, etc., have become very dear, new attractive articles are poured into the country to which they fall victim. Hence they want more money, and teaching of improved methods of profitable production should be the sole aim of the department.

I have given the methods of extension work done in America. The teaching of boys and children can be done by assembling them in one building called a school. The agricultural officers are in fact teachers of the methods of production in fields. Farmers are not expected to assemble in one building, but officers must visit their houses and their fields and give them new knowledge and teach new methods. The officer must remain in the village and see the fields and watch all operations and show them the methods by his own hands.

People are not educated, and hence teaching by correspondence is not much resorted to in India.

The agricultural officers must feel that they are teachers, and that they are to prepare the people to work as good farmers, but at present that is not the case. The officers expect agriculturists to come to their offices and learn lessons from them. Their attitude towards the general public is not satisfactory. In Berar, this year there was too much rain in September and insects had attacked leaves of cotton plants. I doubt how many agricultural officers left their offices during this period and ran to villages to give relief to people. Drainage of fields and other remedies to remove water could have been suggested. Secondly, there was a long break in October. For this inter-cultivation or other methods could also have been suggested, but as there are no statistics showing the officer's visits to villages during this period, one is at a loss to know whether the people in villages get any help from the officers. To do real work people must be reached. It is by their contact and association that the rural people will be improved. Some educated people must also go and live in villages. Then, and then only, they will know the needs of the people. Reorganisation of the village is necessary. People must be made merry, happy and contented.

Railways.—The railway companies should reduce the inland rates of conveying rural produce from one place to another. They should give facilities by opening branch railways and by opening up communications to villages for passengers and goods traffic. Now that the railways are managed and brought under State control, there will be no difficulty in meeting the wishes of the people. Transport facilities should be offered as far as possible.

Roads.—If my scheme is approved village roads will have to be put in order. At present the condition of roads under District Council control is not satisfactory. No attention is paid to the conveniences and comforts of the rural population. The District Councils must spend money supplemented by Government contribution. Recently the Road Improvement Project Committee has been appointed by His Excellency the Governor of the Central Provinces and greater attention is now paid to the extension of road facilities throughout Berar. This is a satisfactory feature. In this way, if all roads joining villages are thoroughly repaired, the troubles and hardships of farmers will be lessened to a great extent.

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Postal and Telegraph Departments.—These departments are the best managed departments in the whole of India. They in fact look to the public convenience and comforts—an ideal which is in force all through in England and America. The other departments should have the same ideal in view. I think this subject requires serious consideration as all the agriculturists are concerned therein. It will be better if this ideal is followed by the Department of Agriculture.

The assemblage of various facilities as shown in my suggested scheme (*Appendix XI) with good and passable motor roads will draw many people from their homes to see this novelty through curiosity, and if the demonstration methods shown there prove successful, the news will be taken to other villages and usefulness of the institutions will be known to all. Some intelligent spectators might get the idea and try the methods in their own fields. In this way the utility of the novel scheme shown in the drawing might be familiar to all directly and by indirect methods.

Meteorological Department.—The science of meteorology is not much known in the country, though a Government meteorological observatory is maintained at Colaba, Bombay.

Observations are taken daily and are published in the *Times of India*, Bombay.

I was elected a fellow of the Royal Meteorological Society, London, in 1911. During 1911 I read many publications and books on the subject, from which I think a great deal of attention is paid to this science in England. Weekly lectures are delivered and reports are published. From the descriptive notice of the prospectus of the Society it seems that a large library of the Society is maintained in London which contains about hundreds of thousands of books on this science.

Atmospheric conditions are observed from which the officer in charge of the observatory at Bombay can foretell rains, storms, cyclones, dust storms, etc. Use can be made of the science by the Agricultural Department. The Agricultural Department might get intimation from the Bombay observatory as to when it is likely that there will be rainfall, dust storms or cyclones and when such intimation is received the Agricultural Department may give notice of this intimation to the agriculturists of the Province. So that they will be on guard and try to carry out agricultural operations beforehand and thus save the crops from being damaged by rains or storms.

I do not know whether the Agricultural Department in this Province and other Provinces of India are in touch with the observations made at Colaba, Bombay. I think statistics of every day rainfall should be maintained in the offices of the Director and Deputy Director of Agriculture.

I think popular lectures on the relation of agriculture to the science of meteorology will be welcomed by the rural population. This may form part of propaganda work.

QUESTION 5.—FINANCE.—Agriculture is an industry and every industry requires financing. So financing is a very important question. When we start an industry we first make arrangements for supply of capital which is required for these purposes:—(1) For purchase of land and for building, (2) for the purchase of the necessary machinery and (3) working capital for carrying on the business. Let us see how far the agriculturist cares to see that these requirements are fulfilled. He has got lands from his ancestors and has also got some machinery, implements, tools, etc., and one pair of bullocks. So that the first two requirements are fulfilled. He requires no money. But he wants capital for carrying on his cultivation business and for the support of his family and to feed the pair of bullocks which he gets from his father. He sees that he has got some *juari*, 1 *khandi* or so and a few *pullas* of *kadbi*. He does not care to see whence money could come for cultivation expenses for the purchase of the seed, etc. The need for money comes ahead and he begins to search for it. He thinks that he is a cultivator and there is no other profession to follow excepting his ancestral trade. So he submits to his lot and goes on.

The following are the agencies who supply him with funds:—

(1) The *Mahajan* or the village moneylender.

(2) Government *taccavi* advances sanctioned every year.

(3) Banks (modern).

(4) Co-operative Central Banks or credit societies of the village.

* Not printed.

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The *Mahajan* or moneylender is generally a man who maintains himself by this profession. Marwaris are generally very shrewd people and they have got the knack for earning profits. Many Marwaris have come down and settled in Berar and have now become landlords of hundreds of acres of land. Poor people are driven to borrow money for cultivation expenses at a high rate of interest and pay also *balajee* and *dhorne* and other charges. When the crop is ripe for cutting, the moneylender sends a man to watch the crops on which he has got the first charge. When the harvested cotton is ready for sale, the moneylender takes the cart laden with cotton to the nearest market and sells it and out of the sale proceeds the debts due are first cleared with interest and other charges. The accounts are made up by the Marwari and the poor man simply nods his assent and goes with some balance in his hand. When he comes home he thinks of purchasing some *jawari* or clothes for his children and his wife and the whole balance is spent In the meantime the village *Mahar* comes and asks the man for the payment of Government assessment of land. The poor man asks him to wait but the *Mahar* replies that if the money is not paid by the 15th of February double the amount of assessment shall have to be paid. The *Mahar* goes away and returns the message to the *patel*. The poor man again becomes anxious and fearing the penalty again goes to the Marwari and begs of him to pay the assessment amount. The Marwari with reluctance pays off the amount to the poor man but warns him that he shall have to pay 3 per cent per mensem interest with compound interest if not paid in time. He submits in order to pay the assessment and somehow satisfies the Government servant. In the meanwhile litigation, marriage festivities and amusements such as an Indian circus at Paratwada when his children are after him demands his attention. In this way the days pass on when again the time of summer cultivation operations come on and money is again needed for the purpose.

The agriculturists are thus involved in debt and the Government is trying its best to remedy the evil.

The Co-operative Central Banks and co-operative credit societies have been established for their help and they are helping the poor people to some extent. I am a Director of the Central Co-operative Bank, Ellichpur, and I know by experience that a considerable amount is advanced every year at the small rate of interest of one per cent per annum but even this rate is too high. But I noticed one defect in the administration of the Bank. No strict supervision is exercised by the village societies as to whether the money advanced as a loan is really utilised for the improvement or use of the lands for which it is advanced, or, for instance, whether it is spent for building a house or for purchasing a grinding mill.

Taccavi loans are advanced by Government every year through Tahsildars. But the procedure followed by Government is a tedious one and it takes a long time for the money to come into the hands of the applicant. The procedure should be abolished and a special officer of the status of a University graduate (many are available) should be appointed on a decent salary for distributing the amount to respective applicants by going to villages or to a central village which is in the centre of a group of villages. This will be a convenient arrangement and people will be fully satisfied. He should also be asked to pay surprise visits to various villages and ascertain whether the money is really applied to the land. If the work is found insufficient to engage his whole time, some other office work may be given to him.

Short-term mortgages are not good for these ignorant agriculturists, appointed time goes at once and the land passes in the hands of *Mahajans* very soon. Long-term mortgages are better, but the debtor must be careful and see that the payments are regularly made to the moneylender.

In short, it is very difficult to save the farmers. The habits of thrift and economy must be developed and to attain them education is very necessary. It is said that land mortgage banks should be opened but, in any case, the management should rest with an agriculturist who should be a shrewd, careful and educated man. But after all Government must help and advance money freely at a small rate of interest and help the Co-operative Central Banks by advancing them as much money as will be required. But in the end the cultivators must themselves be careful and must develop habits of thrift and economy.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—The causes of agricultural indebtedness in Berar are as follows:—

(*a*) Ignorance or want of education.

(*b*) Less production of crops per acre.

(*c*) Want of thrift and economy and practical common sense.

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(*d*) Litigation, marriages, etc.

(*e*) Prompt payment of land assessment on a certain date.

(*f*) Heavy assessment on revision.

(*g*) High rate of interest and compound interest.

The question of agricultural indebtedness is very difficult of solution. For many years indebtedness has been increasing but the agricultural community itself is not minding it. Moneylenders, though they are of some use to them, are unkind and unsympathetic and are very much inclined to exact money from cultivators having an eye upon their landed property. A Marwari who came with a *lota* (brass pot) and bedding in his hand to Berar from his country has now become, within the space of 40 years, a big landlord (owning 500 or 600 *tiffans* of land equal to 2,400 acres) paying a land revenue of Rs. 5,000 per year. In this way almost all lands have passed from poor cultivators to moneylenders, some of these might represent the case of a Shylock of London. This is a great evil and attempts are being made by Government to save the farmers from the clutches of *sowcars* and no success is obtained as yet. Though these legitimate landowners are themselves ignorant we should try to save them.

Co-operative Central Banks and village credit societies have been started and are rendering valuable help to the cultivators. Money is advanced by them at a certain rate of interest but the rate of interest must be still further lowered in order to attract the cultivators to these banks. There are about 18 Central Banks in Berar and I have had the experience of being the Director of the Central Bank, Ellichpur. A good sum is advanced to the *Kunbis* every year, but repayments are not made regularly owing to diminished production of crops every year.

The present year is again short of crops just like last year which was also a year of short crops. Consequently lakhs of rupees remain unpaid to Central Banks. Again there is a complaint of shortage of crops owing to want of rain in October.

One defect I have observed in the working of these societies is that no supervision is exercised either by the village societies or Central Banks or the Agricultural Department as to whether the money is appropriated for improvement of the land. The Government should pay attention to this.

Education is the only remedy. However Government may pass necessary laws lowering the rate of interest and prohibiting compound interest and passing a Moneylenders' Act as in the Punjab. There is no use restricting alienation of lands. The condition will be worse as is the case in the Central Provinces.

There is the Insolvency Act in force. The *Kunbis* who are indebted to an extent greater than the value of their property always, put in applications in the Insolvency Courts to declare themselves insolvents. No separate village insolvency law seems necessary.

The present law relating to mortgage already gives ample facilities to the defendant mortgagor to pay off the money and redeem the mortgage. Notices are issued to show cause why the lands should not be foreclosed. More time is again given to accommodate the debtors and the courts are always lenient towards the mortgagors with a view to save their property. But they do not imagine the results of their own acts and when the property goes away they repent.

The departmental officers must teach scientific methods of increased production. The rainfall must be regulated by investigating the causes of the shortage of rainfall. In short education is the only remedy.

The establishment of land mortgage banks for advancing long-term loans is a remedy suggested by some people. But even in this case if a cultivator is not educated he will squander money when crops are good, and when he has in any year a small yield he will be unable to pay the instalment. The banks should manage the lands and recover the loan in instalments within a period of twenty years. But is this practicable?

QUESTION 8.—IRRIGATION.—(*a*) (iii) Well irrigation in Berar.

(1) Berar is a small compact Province, with a population of about 3,000,000 of people. It is mainly an agricultural country. The people are intelligent but are not educated except in the case of the higher classes. The soil is fertile, and with a good and timely monsoon it gives a bumper harvest. The peasantry is hard-working but is involved in terrible indebtedness.

(2) The needs of the Province are—(1) Good seed; (2) good tillage; (3) a cheap supply of manures which should be within the easy reach of a poor cultivator of four or eight acres of land; (4) money help at a cheap rate of interest; (5) good and timely rainfall; (6) facilities for marketing.

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(3) The crops grown are:—

1. Cotton, (2) *juar*, (3) *tur*, (4) *til*, (5) hemp, (6) linseed, (7) wheat, (8) gram. Even the Melghat, a hilly tract of Satpura hills lying towards north of Ellichpur, produces (1) cotton, (2) gram, (3) wheat (4) potatoes. The land is reddish and good.

(4) There were many gardens and orchards in old days in Berar. But the number is now reduced owing to high rate of cotton and the evils of *Sarbarai* in old days. But even at present here are 5,000 to 7,000 acres of land under garden crops watered by the well irrigation. The *Barees* and *Malees* are generally the people who cultivate garden crops. Plantains, vegetables, betel leaves, potatoes, onions, chillies and other crops are grown in these garden fields called *vadis*. These people are generally well off and not indebted. But it must be noted that their women and children work in the fields. Women are generally hardworking—they themselves go to all weekly markets and personally sell the garden produce to people.

It generally happens in Berar that at first there is rainfall which is more than enough whereas in the latter part of the season the rainfall ceases and crops begin to wither. This year was a peculiar year. We had late rains which commenced on 4th of July 1926. First the rainfall was excessive and then there was a long break which caused crops to be dried up. The season was bad. There were no crops or perhaps there might be 8 to 10 annas crop in some places in Berar. In some fields there was *bandi*—there were no ears of *juari*. On the whole this is a bad year and the agriculturists are ruined in fact. Had facilities of well irrigation been provided in Berar, the Berar cultivators would have got some relief.

I therefore suggest that the facilities of well irrigation should be provided in Berar. In the first place a survey of the tract of land near water may be made and Government should dig wells in the fields of cultivators at a certain proportion. They should be constructed and handed over to cultivators. Money may be advanced from *taccavi* funds and the wells should be constructed under Government supervision at a cheap cost in consultation with the *Panchas* of the village. No engineering estimate should be passed unless it is approved by the *Panchas*. In short the work should be done as economically as possible.

A perusal of the Indian Irrigation Commission Report published in 1901-1902 shows that there are hundreds of wells constructed in the United Provinces and the Punjab and other places so that the cultivators are profited thereby. If wells are supplied to cultivators they may take to growing fruit trees such as plantains, grapes, oranges, lemons, mangoes, etc., for which there is a great demand. Vegetables may also be grown in plenty and an industry can be built up of the surplus vegetables that may be preserved by the dehydrogenation process. In this way there will be a great stimulus to agriculturists to take to some by-industry. Now as the cotton rate is going down, the cultivators will resort to gardening which may prove more profitable now than growing cotton. Arrangements may be made to supply pumps and small oil engines on hire purchase system.

Some intelligent and interesting processes of utilising the surplus rainfall in a year were demonstrated in the great agricultural show held at Poona in October 1926 by one European expert. Some 5 or 6 processes were shown. I suggest that agricultural officers of Berar should study these processes and try them in Berar, when there are such opportunities to do so and they should be explained by the officers of the department to people interested in agriculture in a public meeting held in some village or town.

QUESTION 10.—FERTILISERS.—Lands under cultivation are generally now exhausted as they have been cultivated for years together, without giving them a proper supply of manure. I think the Indian peasantry, I am speaking especially from the Berar agriculturists' point of view, are in need of cheap manures, more than anything else. Cotton is sown everywhere for many years on account of its high prices—the sowing of *juar* is neglected and the old method of rotation of crops is also forgotten. The small landholders are not in a position to spend money for manure and even big landholders find it difficult to give a copious supply of manure to all of the lands.

Even if the supply of cowdung in the Province is all used, it is insufficient Hence the real necessity and the real duty of the Agricultural Department is to supply to all landholders, small and big, manure at a cheap rate. Cheap manure depôts should be opened in each village or group of villages so that manure will

be within easy reach of the poor cultivators. I know that this is a difficult task and will entail large expenditure for which no money will be available. Cowdung is used at present for fuel but if arrangements are made by the Forest Department to supply fuel to villages I am sure they will utilise the cowdung and urine for manurial purposes.

Plenty of dry leaves fall from a number of trees in the forests, which the Agricultural Department with the help of the Forest Department may turn into manure. An experiment of preparing manure from dry leaves was made at Rothamsted in England. It proved successful. Similar attempts may be made in India for supplying manure to people of the country. There are phosphatic mines in the country which may be utilised for manurial purposes as stated in a resolution of the Board of Agriculture held at Poona There are also other artificial manures which may be prepared by Government and distributed at a cheap rate. People should be taught to utilise cowdung and urine of cattle and they may be induced to live in their own fields with cattle so that they will be able to use cattle manure and to supervise the agricultural operations as well. They will live in open and free air which will keep them strong and healthy.

The use of fertilisers is very important in the productive capacity of the lands. I have given above the view of the general cultivators of Berar .Cheap manure supply in the village is the only remedy, if the productive power of land is to be increased. It is desirable that the Government should prepare artificial fertilisers and supply them to even a poor cultivator. It must be within his power to purchase it. The cultivators are not expected to answer questions which shall be answered by Government experts and the reports should be published in local papers. A resolution was passed in the Conference of the Board of Agriculture held at Poona but it is regrettable to note that no steps are taken by the Government of India to enforce, try or make an experiment. Foreign made manures are not popular but an attempt should be made to supply them at a cheap rate when they may be utilised by the people.

QUESTIONS 11 AND 13.—CROPS AND CROP PROTECTION.—Various crops are sown in the Province such as cotton, *juar*, wheat, *tur* and other pulses, linseed.

The rotation of crops is a good system and is followed in the Province. Crops are intermixed with *tur* and other crops.

Combination of crops in a place is resorted to in America. This system supplies various crops which are necessary for the maintenance of the family and bullocks, cows, etc.

Now as the cotton rate is going down, cultivators will stop sowing cotton and will now resort to a greater extent to *juar*, ground-nuts, castor seeds and other oil-seeds which command high value in the markets. The department should arrange to supply money necessary for the increased production of these crops.

The department should now pay more attention to the methods of increased production of cotton per acre. If America produces four *khandis* of cotton per acre it is not known why India should not produce the same quantity per acre. If the Agricultural Department makes vigorous attempts in this direction, I think, India must produce increased quantity.

Protection of crops.—Poor people try their best to protect the crops but are generally not very successful. Wild pigs which are generally strong and robust animals destroy the crops *juar*, sugarcane, potatoes, ground-nuts, vegetables, etc., to a great extent. It is said that pig proof fencings are available for sale in certain shops and one firm had exhibited such fencing in the Agricultural Show at Poona. But it is said that it proved a failure. One big strong pig jumped and broke the fencing and effected his entrance into the ground and destroyed the crops therein. This is an example which shows how even wild animals can demonstrate the failures of big things or contrivances invented by people in this world.

Experience shows that if a pig is shot out of a batch of pigs that attack a field this incident creates terror and the pigs never come to that field again for several months. I therefore propose that gun licenses should be issued to the good and trustworthy cultivators for the protection of crops. I think that this measure will protect many crops from the invasion of pigs which damage the crops to a terrible extent.

It is said that the pigs dig up an underground pit below the fencing. They go in this pit and then come up in fields and destroy the crops. So in any case fencing will be of not much use and it is therefore advisable to issue more gun licenses to cultivators for protection of crops.

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QUESTION 14.—IMPLEMENTS.—New agricultural implements have come to be used. The iron plough, winnower and chaff cutter seem to have become popular with Indian farmers. Tractor or steam-plough requires a large area and seems a very costly and troublesome business. Rich zamindars might make use of it. At the Poona Agricultural Show some enterprising firms who have been manufacturing agricultural implements of various kinds exhibited them in the stall. Messrs. Kirloskar Brothers, the Satara Engineering Works and Mr. K. B. Joshi of Poona are some of the Indian manufacturers, a fact which does credit to Indians who need to be encouraged by the Government who should purchase the implements and thus increase the sales. I am glad to see that the Central Provinces and Berar Agricultural Department is patronising Messrs. Kirloskar Brothers. There are technical institutes in Berar and the Central Provinces of which the Victoria Technical Institute of Amraoti to which the Government contributes Rs. 7,500 per year has iron and carpentry classes in which the agricultural implements can be manufactured with the help of the Agricultural Department.

More labour saving machines and tools should be invented and brought into use. I experienced this year the difficulty of removing grass by inter-cultivation when there was a large break in the rain. Cotton and *juar* plants had grown high and it was difficult to remove grass within the two rows by *bakkhar* or *dawra*. An instrument or machine to remove this may be invented by the Agricultural Engineer. Too much rain in the first part of the monsoon and an unpleasant break in the latter part have become the characteristic features of the rainfall in Berar and a machine or a tool to deal with the difficulties consequent will be welcomed by the rural people.

QUESTION 16.—ANIMAL HUSBANDRY.—*Cattle-breeding and dairy farming.*—There are nine cattle-breeding farms in the Central Provinces and Berar of which two are going all right and the others are not in a very good condition.

I am not of the opinion that bulls for breeding purposes should be purchased from foreign countries at a high cost of Rs. 2,000 to Rs. 3,000 per bull. The breed produced is strong but in course of time the studs become defective and do not serve the agricultural purposes. Strong bullocks are available in this country and can be purchased at Khamgaon, Gujarat and Kathiawar markets. The breed produced by these bullocks is sufficiently strong to serve the agricultural purposes in the country. Large number of cattle die for want of sufficient fodder and grazing during the famines and it is absolutely necessary to increase the number necessary for cultivation.

I think the system of money prizes to breeders of cattle with a view to encourage them is a good one and should be continued and developed as far as possible. The rich landlords will thus be encouraged and maintain cattle-breeding and dairy farms in their houses in villages.

I am glad to know that a cattle-breeding and dairy farm will be established at Ellichpur in the near future at Government cost.

QUESTIONS 17 AND 18.—AGRICULTURAL INDUSTRIES.—(1) Shortage of rainfall even in one year brings the agricultural population to a miserable condition and hence they are driven to relief works immediately. But the Indian peasantry is not accustomed to hard labour and they find it difficult to meet the famine conditions. At such times other means of getting money to supplement their agricultural income are absolutely necessary for their maintenance. Instructions for carrying on small industries are therefore quite necessary to help these people. The Indian Famine Commission of 1880 has laid stress on the necessity of teaching small industries and the Indian Education Commission of 1882 also recommended the introduction of small or village industries amongst the masses of the country. I therefore suggest that the Agricultural Department should encourage the introduction of small industries and try to teach them and finance them, if possible, by the formation of societies with the help of influential non-officials in the village.

(2) Below is a list of small agricultural industries which may be taken up by the agriculturists to supplement their earnings from fields.

(*a*) Paper pulp and paper making from cotton stalks.

Hundreds of thousands of tons of cotton stalks are burnt down and wasted every year in Berar and other cotton producing parts of India. They can be used for making paper pulp for which there is a demand from the paper mills in the country. I tried my best to make an experiment of making paper from cotton stalks and in January of 1916 I despatched a bundle of cotton stalks from Ellichpur to the Director of Industries, Nagpur. He sent it on to the Agricultural Chemist, Mr. Plymen, who made

an experiment and found that good paper can be made from them. The report is published. Berar cotton stalks were also despatched to London by the Central Provinces Industrial Department at my instance when the Secretary of the Imperial Research Institute, London, made an experiment and reported that good paper can be made from cotton stalks. The Government of India took action upon this report and purchased a special paper machinery from Scotland and an experiment was also made by the aid of this machinery by Mr. Raitt, the Government Paper Expert, who also found that the brown or packing paper can be made from the cotton stalks. A copy of this report was sent to me by the Director of Industries. Now it is a commercial proposition and I am trying to start a company for the purpose if funds will be available. I am not sure of success. I am in need of a paper expert. The history of attempts to make paper from cotton stalks is embodied in the bulletin No. 1 of the Director of Industries, Central Provinces and Berar. We need not try to make paper but mere paper pulp may be manufactured in the village and tin boxes filled with pulp may be prepared and despatched to Bombay, Poona or Titagarh paper mills in Bengal. The process is simple. Cotton stalks are to be cut into pieces of ½ inch length. They are all to be boiled when fibres are separated and turned into pulp which is then washed with caustic soda and tin boxes are to be filled up with pulp and despatched. A trial will have to be made. This may give additional income to the agriculturists.

(*b*) Dehydrogenation Industry or the Industry of drying vegetables. All sellers of vegetables generally complain that they do not know what to do with surplus vegetables. It is a pity that they are ignorant in this respect. The people in Konkan on the west coast and especially women folk dry these surplus vegetables and preserve them and when required they again use them by putting them in water for a while when they are boiled. They have a good taste and are eaten up. When the cry for want of food came up from the front during the great War where American regiments and soldiers were located, the American experts and chemists made experiments and procured vegetables from newly prepared gardens for the purpose. These vegetables were dried by these machines and ships full of these vegetables were despatched to France for the needs of soldiers who were engaged in the War. A beautiful description of this dehydrogenation industry is published in the issue of the *Scientific American*.

This industry will be profitable to big owners of gardens and orchards if they are taught the process of industries mentioned above.

(*c*) *The Fruit Canning Industry.*—India is well known for fruit trees especially mangoes which grow in abundance in Ratnagiri district on the Western coast. They are all exported to Bombay when there is a large demand for them. The canning of fruits and despatching them to London where there is a great demand for them will be of greatest benefit to the people. I myself own a garden of 350 grafted mango trees about a mile off from the Ellichpur Cantonment. I lease out the trees and get some income. But the contractors complain that immature fruits fall down owing to strong winds that prevail from the Northern Satpura Range in the months of May and June. Fruits fall down and the contractors are unable to make use of the unripe fruits which they sell at a cheaper rate in the local markets. Hence ripe fruits are not numerous and they complain of the loss sustained in this way. It is said that a copious water-supply is necessary to prevent the falling of fruits in a raw condition. There are two wells with plenty of water but the lifting of water by means of the *mote* has become prohibitively costly and an adequate supply of water could not be given. I therefore requested the Agricultural Department to give me a loan of a plant of small oil-engine and pump on the hire purchase system. But the reply was "Not in stock". I could have purchased one from Bombay firms but for want of sufficient funds I could not do so and I wished that the department might help me in this undertaking in which I have invested a large amount. People expect Government to help in carrying on a business. But the teaching and introduction from the Agricultural Department is necessary to make it successful and popularise it amongst big zamindars, landlords and vegetable growers on a large scale.

(3) The Bombay Government appointed a Committee to enquire into the conditions of the mango trade which made many recommendations for remedying defects. *

(4) In this way there are many other small industries which can be introduced and taught to people by the Department to gardeners and vegetable and fruit growers. The functions of the department should thus be extended. The work of planting fruit trees and marketing of fruits also be included in the programme of the work of the department.

I am glad to note that the special train that took away Berar farmers to see the great Poona Agricultural Show was utilised by me by the kind permission of the Deputy Director of Agriculture who arranged to distribute 700 copies of my pamphlet on industries to the Berar farmers getting to the train at Badnera.

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*Not printed. *Report of the Mango Marketing Committee—Bombay—Government Central Press—1925.*

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The real agriculturists are generally engaged till 31st March of each year and they have generally not any work to do from April to June both months inclusive. But their summer operation commences from the 1st day of the new Hindi year and some of them do not find much time after that. Also much other labour is available in these months hence they can find some time to do other subsidiary work.

Rope making from hemp is an ancient profession which is carried on by some old *Kunbis* to a small extent—for machine made ropes are now purchased in the market at a cheaper rate than hand-made rope. But female labourers, who are generally employed during rainy seasons for weeding grass (*nindhai*) and for picking cotton and cutting *juar* ears in the harvest, remain unemployed in these months; and some subsidiary work must be found to keep the women folk engaged in some small industries. Female labourers are many in villages; however those who are in need of some business will earn some wages per day in small industries.

There are also women who cannot work outside owing to the *purdah* system.

Amongst the women of middle class there is a need felt of adding some income to that of their husbands. These women are in need of indoor work. The helpless widows also are in need of such help.

When I had been to Poona I saw in the Girls' High School and Professor Karve's University hundreds of girls receiving education but generally of an academic character. There are also many girls receiving education in Amraoti, Akola, Nagpur and Bombay and other cities in the country. But the question of their means of livelihood comes only of course when they become widows. There is a large number of women or girls of that nature and for whom some subsidiary industries shall have to be introduced for their maintenance.

I have got some experience of small industries and I was the President of the Board of Directors of the Berar Match Manufacturing Co., Ltd., Ellichpur, started in 1908. The concern was closed for certain reasons which I explained to the Indian Industrial Commission. I had also started a *biri* factory but I could not carry it on as it proved to be a losing concern. I was interested in these small industries for many years and I read a paper on "small industries and scope for their development in the country" before the Indian Industrial Conference held at Bankipore in Decemher 1912. I am also a member of the Industrial Board, Central Provinces, since 1922.

Small industries subsidiary to agriculture can be and should be started. An Industrial Survey Committee was appointed by the Central Provinces Government in 1908. I had the honour to be a member of that committee and Sir C. E. Low, K.C.S.I., sometime member of the Commerce and Industries Department of the Government of India, was the President. An enquiry was made and a report was published in 1911.

Similarly a report was published before 1908 dealing with small industries in the United Provinces where there are a good many carried on even at present. The population there is much more industrious than in Berar.

The following small industries are dealt with in these reports:—(1) Cotton weaving, (2) silk weaving, (3) blanket weaving, (4) gold and silver thread making, (5) oil pressing, (6) leather and hides, (7) alloys, (8) brick and tile making, (9) pottery, (10) dyeing and painting, (11) smithy, (12) carpentry, (13) iron crackers, etc.

From experience I think that the following are the difficulties that stand in the way of opening small industries:—

(i) Want of expert knowledge and the help of experts.
(ii) Finances.
(iii) Demand for the articles.
(iv) Marketing and sale agencies.
(v) Want of enterprising spirit.

The Government is concerned with the first two and the people with the remaining causes. Sir C. E. Low has recommended that Government should provide experts and small machinery such as in the case of brick and tile making, pugging machines and a kiln which requires less fuel.

The public should open co-operative industrial societies, form themselves into sale agencies, and create an enterprising commercial spirit in rural areas. But the Government must take the initiative and start such industries.

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My paper-making from cotton-stalks is now a commercial proposition. I must have money and a paper expert. If only pulp is produced by the villagers it will meet the demand of the paper mills in India. There are many other industries such as oil-pressing, paper-making from rags which may be mixed with cotton-stalks, bee-keeping, lac culture, pisciculture, etc. which can be carried on but it is not possible to do anything in the absence of the Government initiative and money which is absolutely necessary.

Carpentry and Smithy.—The village carpenters and smiths are in need of help. They simply repair wheels and agricultural implements and put up tyres on wheels. But if they are taught more they will be better than the old ones. The Victoria Technical Institute at Amraoti gives higher training. The course is of two years If those who are trained there go back and settle in villages they will have better prospects of maintaining their livelihood. Many small machines will have to be made and repaired and the carpenters and blacksmiths of a better type will be needed. The development of small industries is sure to afford useful employment. People who know how to manage small oil-engines will be greatly needed. If facilities of well-irrigation are provided in the villages, it will employ a great deal more of ordinary and skilled labour.

The spinning wheel (*charka*) will prove a good cottage industry and it will be a source of income to workers who wish to work in their own houses. A good organisation is needed.

The weaving industry is also a cottage industry but for the last century it has had to face the competition of the manufactured goods of the mills of India and foreign countries. It prepares goods from coarse yarn which are mostly needed by the masses.

In Berar there are many weavers at Ellichpur, Ellichpur Cantonment, Anjangaon, Kolapur, Balapur and other places, and there is a large population of weavers in Nagpur, Kamptee and other places in the Central Provinces. The Industrial Department is active in this respect and a cotton expert has been employed to do the needful. The Vaidarbha Mills, Berar, is opened at Ellichpur and it is possible that many weavers may be attracted to serve in this mill at the sacrifice of their own old art of hand-weaving. I think that the art should not be allowed to disappear. The weavers can prepare good clothes such as *khadi rumals, atkas, lugdas* or *saris, cholikhans*, embroidery work, etc.

I therefore suggest to the Industrial Department of the Central Provinces to open a weaving school somewhere near Ellichpur where some rural farmers might learn the art of weaving which will afford supplementary labour and wages to them. The information given in the *Times of India* of Bombay, November 1926, is interesting and worthy of study.

QUESTION 19.—FORESTS.—Forests in the country are a valuable asset given by Providence well supplied with various kinds of raw materials useful to mankind; production does not cost even a pie to Government except when there is artificial production. The only expenditure incurred by Government is as regards the staff necessary for the maintenance and protection of forests. The administrators generally look at matters from the natural and broad point of view. But the village point of view is quite different. The people wish that provision should be made for grazing of cattle and pasture lands should be set free for grazing. I appreciate the advantage of the Government policy but the administration of any branch of the department must be as far as possible sympathetic and meet the wishes of the people.

Grass is required for feeding cattle. Bullocks are needed for agricultural purposes. Buffaloes and cows are needed for the supply of milk which is required for infants and children. Butter and *ghi* are also needed as tonic in food for people in general. So that cattle are an important asset for both the people and the agricultural purposes.

Sufficient quantity of forest area should be kept reserved for grazing of cattle and free grazing should be allowed to the greatest extent possible. Comparisons are odious. But in administrative matters they are needed to demonstrate the utility of the Government administration carried on in the civilised countries of Europe and America.

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I give below a statement prepared in America which will at once show how much less land is devoted to cattle-grazing in India.

Name of country.	Total acres of land (in lakhs.)	Acres of land left for grazing and pasture.
Great Britain and Ireland	775	230
Germany	1,332	214
New Zealand	67	27
America	19,023	1,170
Japan	1,056	175
India	9,600	352
Bengal	505	30

The above figures clearly show that very much less land is reserved for grazing in India than in other countries.

In the Central Provinces and Berar during the year 1922-23, 3,151,919 cattle grazed in the forest, and the grazing fees amounted to Rs. 11,91,851; whereas in the Bombay forests 2,466,511 cattle grazed, and the grazing fess amounted to Rs. 4,85,804. This shows that the grazing fees in the Province are higher than those prevailing in the Bombay Presidency (*vide* Bombay Forest Administration Report for 1922-23 and also Agricultural Report of the Central Provinces and Berar for 1922-23).

In the Central Provinces and Berar in 1922-23 the forest revenue was Rs. 47,06,083 and the expenditure was Rs. 30,12,748, and the balance was Rs. 16,73,406 for the same year. In the Bombay Presidency the income was Rs. 70,15,000 and the expenditure amounted to Rs. 38,67,000 and the balance was Rs. 31,68,000.

The percentage of acres of grazing per cattle is as follows. The grazing incidence varied from 2 to 4 in Akola, 14·1 in Melghat of the Berar Circle and 2·1 in Damoh to 6·9 in Hoshangabad of the Northern Circle, and 3·5 in North Chanda to 10·7 in Bilaspur of the Southern Circle of the Central Provinces.

The Forest Department should allow facilities to villagers to make use of forest produce. It should supply sufficient fuel to villagers at a cheap rate and store it in villages within the easy reach of the people. Sufficient grazing lands should be set apart, say, hundred yards of the forest area from the village, for the use of cattle grazing. Some portion of the forest area should be handed over to the panchayats of the village for management. The Panchayat Act has come into force in Berar and the Central Provinces and the Government has appointed a special officer to form these Panchayat Courts and thus develop the old panchayat system in the Province.

There are no apprehensions therefore regarding the development of the panchayat system and the efficient management of the forest area entrusted to them.

QUESTION 20—MARKETING.—Marketing is a comprehensive subject and it is not possible for me to deal with the question from the point of view of the whole of India. I will therefore limit my criticism to the Province of Berar.

Generally there are Municipal Committees established in Berar, and wherever there is a Municipal Committee cotton markets and grain markets are also established. Within the limits of the Ellichpur Civil Station Municipal Committee, there is a cotton market as well as a grain market and there are sets of rules sanctioned by Government

for their management. I was in charge of this Municipal Committee for 26 years—8 years as Honorary Secretary and 18 years as its Vice-Chairman. I was a Chairman of these markets for some years and I have got some experience of their working.

There are *adtyas* and *dalals* licensed by the Committee on payment of certain fees. They transact business on behalf of the agriculturists. The *adtya* generally supplies money to the agriculturists whose cotton is sold after taking some percentage commission and he gets this money back from the owner of the ginning and pressing factories to whom the cotton is generally sold. The *dalal* settles the bargain and cotton is weighed by weighmen who are also licensed by the Committee on payment of certain fees. In this way there are three middlemen in the business before the money goes to the hands of the cultivator; and he being ignorant may be deceived by these middlemen. It may be noted all the cultivators that come to markets are under the thumb of the *Mahajan* or *sowcar* whose man is always present to get hold of the sale proceeds in repayment of any loan. The culivators get only what remains after the accounts are cleared.

The middlemen do some work and get their commission for doing the work because the cultivator is unable to transact the business himself so that the agency of these middlemen is absolutely necessary as long as the cultivators remain uneducated. The only thing possible is that the Chairman of the Committee should himself personally supervise all transactions and see that the cultivators are not deceived or molested.

There is a grain market estblished by the Municipal Committee quite near the town. A committee is also appointed to supervise the operations. The whole of the crop from Melghat and Betul in the Central Provinces comes into the market. There are here also middlemen and measurers who are licensed by the Commitee on payment of certain fees but the system of selling of grain is peculiar. No rates are settled but the cart loaded with grain is put up to auction per *khandi*, say, Rs. 30 for *juar*, *tur* etc. If there be potatoes, *lac* or other produce then at a certain rate per maund. The highest bidding is accepted and the highest bidder pays cash to the owner of the stuff. The treasurer gets some fees for measuring the grain at a certain rate per *khandi* or maund. The man who sells by auction gets some commission and sometimes he advances cash to the purchaser if he has not got money, on the security of the grain purchased and on payment of some interest.

But the standards of weights and measures are not uniform in India and even in the Province, *e g.* the *paili* is of two seers here at Ellichpur whereas the *paili*, at Akola is larger than this. It is absolutely necessary that weights and measures should be standardised. Though it is some years since the Weights and Measures Committee reported, nothing seems to have been done in the matter.

In America cotton is graded and sold. The ignorance of Indian cultivators will not permit the introduction of this system but it is time to consider whether the weights and measures should not be standardised and whether the auction system is good or bad. The sub-committee of the Indian Central Cotton Committee has approved the Berar Cotton and Grain Markets Rules in force in Berar and recommended that they may be made applicable to all cotton markets in India.

The following are the main crops that come into the grain markets on Thursday which is a weekly market day :—

(1) *juar*, (2) *tur*, (3) wheat, (4) seeds, such as *erandi* seeds, (5) potatoes.

About 7,000 cart-loads come into the market but it may be noted most of the carts come from Betul in the Central Provinces. There is a great demand on this side and the sellers obtain good price. There is a good motor road from Betul to Ellichpur.

QUESTION 22.—CO-OPERATION.—Co-operative Central Banks advance money to an agriculturist but the Agricultural Department does not care to see whether the money advanced by the banks is really utilised by them for agricultural purposes.

Dr. Mann referred to this in the Conference of the Board of Agriculture held at Bangalore.

As a Director of the Central Bank, Ellichpur, I know that the Agricultural Department was never in correspondence with the Bank or village societies and does not enquire how much money is advanced, to whom advanced and what has become of that money.

QUESTION 23—GENERAL EDUCATION.—I am still of opinion that no attempt is made in the direction of compulsory education and the creation of agricultural bias in the minds of students.

R. S. G. N. SAHASRABUDHE.

The syllabus that existed till the year 1924 seems to have been amended now and no attention is paid to gardening both by the teachers and the Deputy Inspectors. I think gardening and nature study should be taught which will give young boys of the farmers some liking for agriculture and industries. The Education Department in Berar should pay attention to this and the syllabus if necessary may be amended.

The same is the case with Anglo-vernacular schools and high schools in the Province. Sir Charles Wood's despatch of 1854 by which the present educational system was introduced in India is very important and deals with the question of education from all points of view and has emphasised that the instruction should be given in all arts and sciences so as to be suitable to the country in future years. The despatch is statesmanlike and is clothed in words which shows magnanimous and generous mind which was full of liberal and democratic principles which are absolutely necessary to produce right type of citizens, artists and scientific people. Clerks were needed at the time to carry on various departments of administration which had to be established in the country at the time. Hence education of a general and academic character was imparted in the school and Matriculates, B.A's. and M.A's. that were produced in the schools of that time were given high lucrative appointments. in the departments that were newly established or were being established at that time.

This created a strong impression on the minds of youths of the country that by becoming B. A's. and M. A's. they get highly paid appointments in the Government service. This impression still holds on their minds and hundreds of thousands of young boys throng the high schools and try to receive instruction of a purely academic character which is of no use at the present time. When a notice appears in a newspaper that a place of Rs. 60 per month of a school teacher or a clerk is vacant, hundreds of applications flow in from B.A.'s and even M. A.'s, seeking the above appointment. Out of these one graduate man gets the job and the others are disappointed and go away.

In this way the present system of education is defective and it requires to be improved. The syllabus must be amended and industrial bias in the minds of boys must be provided for in the schools in this Province from primary education to Anglo-vernacular and high school education.

A son of a rich landlord wishing to learn agriculture, must pass through primary and secondary grade schools then after passing Matriculation examination he is to join the Agricultural College at Nagpur when he is to learn for the first time the principles of agriculture during the first year. After spending 2 years more in the college he passes the B. Ag. and even after passing the examination he is not found capable and competent to teach efficiently the methods of agriculture to the rural people.

One year's practical instruction is absolutely necessary before he is employed in the department. This system of general education does not produce salutary effect on the minds of young boys. They live in well-built buildings, and they receive education in well-built, costly schools. Boys being accustomed to such a way of living on return home find themselves inconvenienced and are ashamed to live in their houses and thus put their parents to an unnecessary expenditure. They are ashamed of holding the plough or other agricultural implements in their hands and refuse to help his father in the agricultural operations.

On arriving at Amraoti if the members of the Commission will pay a flying visit to the King Edward College they will see a very costly college building equipped with a very large beautiful boarding house or hostel with large and spacious rooms with terrace and gallery supplied with electric lights everywhere, on all of which 16 lakhs of rupees have been spent. Naturally a student accustomed to live in this costly building will feel ashamed to live in the house in which he was born. The country is poor and does not require such costly buildings.

Boys in the village generally do not like to attend the schools, and their parents think that they will lose the wages they can earn every day. The sons of rich landlords think that they require no education because they have got ancestral lands to support them and their families. India is a poor country and education is received by the people not for education's sake but as a means of livelihood. Compulsory education is therefore needed.

But the fact of the matter is that good teachers are needed to teach the boys. In India the ideal of a teacher is quite different from that of a teacher in England. In this country, the teacher only looks to the results of the annual examination and tries to get as many boys passed in the examination as possible, and when he sees

that more than 1/3rd of the boys have passed he feels himself satisfied and thinks that he has done his duty. He does not care for the future well-being of the boys nor does he care to see or think how the boy will be able to maintain himself.

But the ideal of a teacher in England is different. He teaches the boys as in duty bound and feels that he is paid he must be true to the salt and he not only teaches the boys in the subjects given in the curriculum but he always cares for his future welfare and the formation of his character to be a right citizen. In short he takes care of the boys from all points of view just as a father takes care of his own son.

When a student passes his Vernacular 4th standard or English 4th standard the teacher should ask him what specialised education, whether industrial or agricultural, he wishes to have. The teacher should impress upon the minds of the students the benefits of this sort of education. The student then should enter those schools and carry on their further studies. By this system, the attention of the student will be diverted from the academic course to industrial and agricultural courses.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(1) Improvement of agriculture and (2) agricultural education and agricultural industries really form main factors of the welfare of rural population. Besides this, there are also other matters which require Government's help. They are—

(1) Civil dispensary,
(2) Veterinary dispensary,
(3) Panchayat court,
(4) Sanitation office with a good sanitary committee,
(5) Police station,
(6) Good roads in the village itself,
(7) Vaccination office,
(8) Wells of good and drinkable water ample for all castes and creeds,
(9) *Hakim* or *vaidya dawakhana*,
(10) *Chawadi*,
(11) Dâk bungalow,
(12) Sufficient grazing ground,
(13) A cattle stand,
(14) Good clean and airy houses,
(15) Vegetable market, and
(16) Weekly market, etc., etc.

The District Councils and Taluk Boards should be encouraged to look to these matters. The Tahsildars and Deputy Educational Inspectors should be told to look to these matters.

Provided with these facilities the village will present a beautiful appearance of a prosperous rural population.

As for an economic enquiry of typical villages, I beg to submit that I will not bother myself with such an enquiry nor will I advise Government to undertake this intricate and difficult business. The people will look upon this as a suspicious business They will not trust officers, they will not disclose their secrets, wealth or profits in the business. Naturally nobody likes to disclose what wealth he has got in his possession. The whole business will be very costly and is impracticable. The country is so much involved in ignorance. Foreign methods will not do here.

QUESTION 26.—STATISTICS.—Maintenance of proper and timely statistics of any subject is of primary importance in the administration of a country.

But the business is very difficult and requires a very careful and earnest officer and many clerks to do it.

Being a pleader I have got some experience of testing some of these statistics. The statistics referred to in the question are generally maintained by the Tahsildar of a taluk, with the help of his *patel* and *patwaris*. The Revenue Inspectors also collect information regarding the yield of crops, land under cultivation, census of cattle, etc.

"*Pere Patrak*" is a statement annually prepared in the months of September and October and the estimate of the yield of the crop is also made by village officers.

A *Mahar* of village or a *patwari* or *patel* goes to some fields and asks the man who is present there "who had sown the fields." The man gives the name of a certain man and he is recorded in the statement as the man who sowed the field. These statement

are given in evidence in the civil courts in civil cases to prove possession of the land. On cross-examination of the village officer I have found that no enquiry is made by him as to who has really sown the land, he fails and generally these statements are not believed by courts without the support of good additional evidence.

Similar is the case with statements of the yield of crops. The village officer goes to field and sees the cotton plants or *juari* ears and forms an estimate of the crops of hundred of acres of lands. It is not known how they arrive at the conclusions. But those statments are believed by Government and returns of yields are based on them. There is no strict supervision over the village officers who are some times corrupt. The methods are loose and clumsy and in my opinion they do not disclose the real condition of crops. The methods and system must be improved.

There is no doubt that agricultural statistics maintained at present are not a correct index of the condition of the lands and their owners. Such statistics when published give an unreal idea to the officers and people and even to foreign people who read them. This is not good. Therefore improvements must be made. But the enquiry will be a matter which will require a lot of time and labour and will at the same time be very costly. The only good and practical method is that the information should be collected with the consent and knowledge of the *Panchas* of the village.

To sum up what is now required we need :—

1. Extension of primary and agricultural education.
2. Teaching of scientific methods and profitable methods of production.
3. Increase of production.
4. Teaching of planting fruit trees.
5. Irrigation of gardens and orchards, etc.

The present agricultural policy should be extended and must be shaped in such a way that the farmers will obtain knowledge as indicated above.

Important points to be attended to are :—

1. Good seed. 2. Tillage. 3. Manuring. 4. Inter-cultivation. 5. Dry farming. 6. Draining the fields. 7. Intensive and extensive cultivation. 8. Methods of profitable production. 9. Fruit and trees planting. 10. Fruit canning. 11. Flower and vegetable gardening. 12. Organisation of orchards. 13. Vegetable growing. 14. Sowing of varieties of cotton. 15. Teaching of small industries. 16. Marketing of cotton and other articles. 17. Well irrigation in Berar, etc.

How many of these are attended to at present may be kindly considered by the Royal Commission. A bureau of plant industry and extension service department should be opened.

Policy of the United States of America Department of Agriculture.

America is well known to be one of the most developed countries of the world and the United States of America Department of Agriculture is also equally developed to a great extent. The departments are well organised and the departmental officers seem to be more in touch with the farmers and they have got business like methods for doing their work. They have got an extension service department in which extension work is done in each branch of the department.

The features of the above extension service are as follows :—

(1) Extension work in Agricultural Engineering. "Agricultural Engineers' duties include the teaching of farmers how to drain their land and to show that the increased production from drained land will pay amply for the improvement". "Under this head are included such subjects as plans for the construction of dwellings, barns, poultry and other farm buildings, farmstead planning, ventilation of buildings and painting and other preservative treatment."

Such extension service branch is not yet opened in India. Here the work is limited to a certain stage. The sphere of the present work can be widened and it is possible to have an extension service branch even in India. This service may include the teaching of planting and growing fruit trees, preservation of fruits, export trade of fruit, marketing of agricultural products, visiting the houses of farmers and making enquiries, teaching of small cottage industries, etc. The Agricultural Department is a teaching department in America. The illustrations given above will show that earnest

and strenuous attempts are made in America to teach the villagers and convince them of the utility of the department. It cannot, therefore, be said that the Agricultural Department in India is working so successfully as it is sometimes said in the country. The rural people are still ignorant and uneducated and there are no statistics showing the effectiveness of extension in teaching rural people. Demonstrations of scientific methods of profitable production are made but there are no statistics to show what effect these demonstrations have proved in the minds of the people and how many of them have actually followed the methods and profited themselves; so that nothing positive can be said without the publication of these statistics.

A passing reference may be made to the recent Report of the Currency Commission which has recommended the raising of the exchange rate of the rupee from 16 d. to 18 d. This recommendation of the Commission is most prejudicial to the interests of the poor agriculturist in India. It is, however, pleasing to note that the Bill brought forward regarding the subject was withdrawn by the Government of India in the Legislative Assembly. I request the Members may kindly recommend the retention of the present rate of exchange and cancellation of the Commission's recommendations and thus strengthen the hands of the Government of India. The poor agriculturists will be really much indebted to this Commission for this act of kindness.

Oral Evidence.

32425. *The Chairman*: Rao Sahib Sahasrabudhe, you are a pleader at Ellichpur in the Amraoti district? Yes.

32426. You have given us a note (including some very interesting illustrations) and we are obliged to you for that. Have you any general statement to make at this stage or may I ask you a few questions on your note?—Regarding demonstration, on which I have already made some remarks, I wish to make a statement. An attempt should be made to run the demonstrations on a commercial basis; the financial aspect of the question must not be regarded as secondary; otherwise, of what use will they be to the villagers? I have met many villagers and talked to them. What they say is this: "If it is proved to us that these demonstrations and other experiments are successful we will adopt them, but not otherwise".

32427. So that you think that demonstrations should be carried out in such a fashion as to give the cultivators a clear indication of the profit-making value of the suggestions?—Yes, that is my opinion.

32428. Your note is very full and I think you have made your points perfectly clear; but there are one or two questions I should like to ask you. With regard to your answer to our Question 8, on page 460 of your note, have you experience of well irrigation?—I have got my own field in the village of Khandi and for two years I conducted experiments on well irrigation, directly supervising the work. I have two wells. I have here a statement which was given to me by the Commissioner of Berar in which it is stated that there are about 20,000 acres of land under garden crops in Berar and these 20,000 acres are cultivated by castes known as *Baris* and *Malis*; these are different from the *Kunbis*. As regards agricultural indebtedness, the former two castes are in a better condition than the *Kunbis*; it is the *Kunbis* that are involved in indebtedness. I think that, especially this year when there is no rainfall, had there been wells in many of the villages at least at the rate of one well for every 6 acres, the cultivators of Berar would have been in a better condition; they would have had more crops this year. This is my object in proposing well irrigation in Berar, where there is no irrigation at all, whereas the Central Provinces are fortunate enough to have a good deal.

32429. Do you use mechanical lift for the water from these wells?—No; we use the bullock *mote* and even that has become costly now. I am searching for mechanical lifts. I have asked the department to supply me with one pump and engine on the hire-purchase system because I am not a very rich man and cannot purchase the whole plant at once. I want to make an experiment on the hire-purchase system first and then next year it is my intention to purchase the whole thing.

32430. You are willing to undertake the purchase of the plant on the hire-purchase system—Yes.

32431. You are interested, I see from page 463, in the making of paper?—Yes.

32432. I think you have done certain experimental work in that direction?—I myself have not done anything, I am not an expert on the point. But I requested the Director of Industries to make an experiment and I sent one bundle of cotton stalks from Ellichpur to the laboratory here. Mr. Plymen, who is Director of Agriculture now, was the Agricultural Chemist at that time and he made an experiment and reported that good paper could be made from it. I then asked the Central Provinces Government to start a pioneer undertaking so that the people might know that it was a profitable concern, but they refused. A suggestion was made by Mr. Crosthwaite that the cotton stalks should be sent to a laboratory in London and to that I had no objection The department accordingly sent the stalks and a very satisfactory report has been made by the Research Institute in London. Then, of course, Government was convinced that as such a satisfactory report had been received from London, this was going to be a satisfactory business and they decided to conduct further research into the matter. With this end in view the Government of India asked the Paper Expert at Dehra Dun, Mr. Raitt, to undertake the business. A special kind of machinery was required for paper-making and during the War one of the ships which was bringing out this machinery was sunk and for a time there was nothing done. Then some time later another machine was obtained and an experiment was made at Dehra Dun in August 1924, a copy of the report which dealt with the experiment was sent on to me.

32433. Have you any indications as to whether the cultivating class would take up an industry of this sort?—I am not sure about that. I tried to persuade the villagers, but they were averse from taking to it. It is a very laborious business, in fact, the whole process is very laborious. Some body would certainly have to make an experiment and prepare a good pulp which could then be sent either to the paper mills at Bombay or the Tittagarh Mills in Calcutta. Attempts must be made in that direction to start with.

32434. I see that you have also interested yourself in fruit and vegetable preservation by the method known as dehydrogenation?—Yes; it is a very splendid method followed in America. They supplied vegetables to the Army in France. The description of this method is given in the "*Scientific American*" and I have copied it from that.

32435. This method of dehydrogenation produces a dry vegetable which has got to be soaked in water?—Yes. This practice is at present being adopted in Konkan. Our women there do it; when there is a surplus of vegetables they resort to this process and utilise it when necessary.

32436. So far no one has tried it in your village as yet?—No, it is only a suggestion.

32437. The Commission is interested in this problem of the standardisation of weights and measures. Do you think the public would be prepared to take that step?—The Marwaris would not care about it; they would say that it was very difficult. The practice in Berar at the present moment is for the Currency Officer to come and inspect the weights and measures every year. Personally I think there ought to be a standardisation of weights and measures throughout the whole of India. Nowadays there is much confusion: for instance, our Ellichpur weights and measures do not tally with those at Akola or those at Amraoti and this causes a good deal of confusion. We must try to adopt one common standard; this would be to the advantage of the public.

32438. To change the subject, I want you to develop this idea of yours which you have set down on page 469 of your note according to which you think a year's practical instruction is necessary before an agricultural officer is employed in the department. Would you include instruction on the commercial side of farming?—Yes, that is my idea, and that is the reason why I wish to follow the American method. I have had a good many pamphlets from America.

32439. On what do you found yourself on page 470 when you criticise the field statistics? Is it your own experience?—Yes, on my own experience in the court. When this question comes up in the court, the *patwari* has got to make a report. He comes with a record which shows that a certain man has sown the field and the amount of the crop is so much. In cross-examination I have found that no enquiry is made by the village officer as to who has really sown the seed and generally these

statements are not believed by the courts without the support of good additional evidence. The enquiry is not conducted at all and the people do not have a real idea of their actual position. I must say that the Board of Agriculture is a very good institution. I have read all the reports of the Board which are published every year and a good many resolutions are passed but I fail to see what further steps can be taken in the matter of bringing these resolutions and these various kinds of literature to the notice of the village people. At the top everything is all right. All the English knowing people are conversant with it; all the officers of the department know it, but whether this knowledge goes to the villagers is a most important question. I really think that these things should be especially explained to the villagers either by the Tahsildar or by some special officer who should be sent to the villages. That would be a very good kind of propaganda work, to let the people know what is going on from day to day. The people of Berar particularly have the power of discerning what is good and what is bad for their own interests. They read the resolutions which are passed and if they see these things they will interest themselves in these experiments and gradually they will readily accept the new and improved methods. That is my suggestion. I am for developing the propaganda work of the Agricultural Department as I am quite certain that many things can be done in that direction. I have already expressed myself with regard to agricultural education. As you know, an agricultural exhibition was recently held at Poona. Now this exhibition was of very great educative value to the people, but I doubt very much if the agriculturists knew anything about it. I suggest that regular officers of the department should be deputed to go into the villages and to lecture to the villagers on these matters.

32440. *Sir Henry Lawrence*: Are you from Poona yourself?—No. I am resident of Berar. My birth place is in the Satara district.

32441. You mentioned Lord Willingdon amongst the people who have done good for agriculture in India. What particular branch of Lord Willingdon's work were you thinking of?—Lord Willingdon, as President of the Board of Agriculture, held at Poona in 1917, gave an address and that address is very interesting. It interested me very much as it deals with the whole policy of the Agricultural Department as to what should be done by the department, what should be taught by the agricultural officers to the students and the people of India, and how much more they ought to know, and things like that.

32442. I thought perhaps you had in mind the example Lord Willingdon had set in the dairy that he started in Poona and his encouragement of cattle-breeding? You were not thinking of the cattle question in particular?—No, I did not have that in mind. His speech impressed me very much as an agriculturist.

You were impressed more with his speech than with his practice?

32443. You said a little while ago that there is a regular inspection of weights and measures every year. Where is this done?—There is an officer called the Currency Inspector at Akola.

32444. Is it done by the Municipality?—No, he is a Government officer and he goes to the Municipal office. He makes a round of inspection in the town shops and examines the weights and measures. At any rate, that is my idea of the work which he is doing. If he sees any faulty measures or weights in the possession of any shopkeeper, he prosecutes him.

32445. Have you ever known of any such prosecutions?—Not within the last two years.

32446. Within the last fifty years?—When I was a pleader I came across one or two cases.

32447. *Sir Thomas Middleton*: You mention in your evidence that you have been reading American publications and you are the second witness to-day who has told us that he has been getting information from America. How did you get these publications?—I asked the United States Department of Agriculture to give me their methods of working the department. They did not describe the method of working their department but sent me these pamphlets and asked me to read them, when I would find out their methods.

32448. How many have they sent you?—About 50 in all.

32449. Have you ever made an application to the Ministry of Agriculture and Fisheries for information?—No.

32450. You wrote to America, but you never wrote to Britain for any information, did you?—No.

32451. *Dr Hyder*: Your note is very comprehensive. You say that the productive power of the land is not increased along with the increased expenditure? Have you any evidence of that?—Even at the present time the productive power of the land is not more than one *khandi* per acre.

32452. How old are you?—I am sixty-eight years of age.

32453. Do you not think that Berar produces more cotton per acre now than it used to when you were quite a young man?—I quite agree with you. The amount of cotton has increased, but along with that the land under cotton cultivation has also increased; that should be taken into consideration. I have got a report of the Deputy Director of Agriculture in which he shows how the cultivation of cotton has increased.

32454. You make a very interesting suggestion about compulsory primary education. You say that the age should be raised from 6—11 to 10—13, both inclusive. If you had that, as the boys of that age are more valuable to their parents, do you not think that you might find all the schools empty?—In order to meet that, I have made another suggestion. At present the schools are held from 11 in the morning to 5 in the evening; I say that these hours are not wanted for village schools.

32455. Let us keep to the age of admission?—That is the answer to your question. The parents will not suffer, because I have suggested that the school hours should be from 7 to 10 in the morning.

32456. What should they do from 7 to 10? They should do nothing?—The boys will remain in school; I am against the present school hours. I say that the age should be raised and the school should be held only in the morning; the rest of the day should be left to them to earn their wages. The parents will be satisfied with that.

32457. You have rendered some public service by distributing 700 copies of your industrial pamphlet to the agriculturists. Was an industrial pamphlet suitable for placing in the hands of the agriculturists?—Yes; at the end of the pamphlet I have given particulars about small industries.

32458. You know the people here very intimately. Are there any items on account of which the people will not undertake certain industries, for instance, fish culture or poultry keeping? Have they got any custom of not ploughing after midday, or not taking meals on any particular days?—I do not think the *Kunbis* will take to fish culture and poultry keeping.

32459. What about silk-worm rearing?—Speaking for Berar, there are no mulberry trees there, and silk-worm rearing is not possible.

32460. Have you got any *Satnamis* in your part of the country?—No. They are only to be found in Chhattisgarh.

32461. The people of Berar are all modern people?—Yes.

32462. With regard to rainfall, you suggest some instrument by which the rainfall could be made more certain and more regular. What is this instrument that you have in mind?—The difficulty is that in certain seasons the rainfall is unequally distributed, and some contrivance should be invented, by which the rainfall could be regulated. Or else, surplus rainfall may be utilised. In the exhibition at Poona, Mr. Lowsley exhibited five methods by which surplus water could be utilised during dry weather. I admit that I am not an expert, but I think the Agricultural Department should take that question up, and explain the methods to the cultivators, or discuss the methods among themselves in order to find out whether they are really useful or not.

32463. What is the rate at which the Central Bank, of which you are a Director, lends to the small primary societies?—It is 1 per cent per month, or 12 per cent per annum.

32464. How are you going to entrust the distribution of *taccavi* loans to University graduates? Do you think they are quite competent to undertake work of that kind?—At present there is great dissatisfaction regarding the distribution of *taccavi*

loans. If an application for a loan is made to-day, the man gets it after 4 months. It might be due to the fact that the Tahsildar has too much work. Therefore, I have proposed a special officer, he need not necessarily be a B. A., who should be entrusted with this work. He should take the money into the villages and distribute it among the applicants immediately.

32465. Are any factors known to you why India does not produce 4 *khandies* of cotton per acre?—There are some factors. An adequate supply of manure is necessary, and there should be sufficient water made available by well irrigation. If they put in sufficient manure and, in case of less rainfall, make available well water, I think they will be able to get 2 to 3 *khandies* of cotton per acre.

32466. On page 467, you give an interesting table, in which you show these two items, namely total acres of land (in lakhs), and acres of land left for grazing and pasture. Do you not think that your table would have been better if you had added also the number of cattle supported and the crops raised, because there are differences as regards the kind of farming which different countries carry on?—I admit it.

32467. You cannot draw any conclusion from that?—No.

32468. I find your mind is made up on this question of the ratio between the £ sterling and the rupee? You are for 16 pence to the rupee?—Yes.

32469. Could you amplify that? It is a complicated matter?—As I understand the question, I am not in a position to say that the agriculturists are benefited by increasing the rate to 18 pence especially in the case of export of cotton from India to Manchester.

32470. *The Raja of Parlakimedi*: I see that you take a lot of interest in agriculture. Do you possess any land yourself?—I have 30 to 40 acres of land, and about 350 grafted mango trees.

32471. What cultivation are you carrying on in that area?—Cotton and *juar*.

32472. Are you following any improved methods of cultivation?—I lease out the land. I am a pleader, and I lease out the land on the *ardha batai* system.

32473. You possess a good knowledge of improved methods of cultivation?—Now that I have retired, I intend to do something.

32474. May I know how long it is since you have retired?—One or two years but my son has passed his LL. B. just now, and I have handed over my practice to him. Now I have got time to look after my fields, and I will do my best as far as possible.

32475. Have you undertaken to translate any of these pamphlets on agriculture into the vernacular?—No. I have not yet done anything, but I mean to do something.

32476. Are you interested in cattle?—I am of course interested in cattle; it is for the good of the people, but I have not got any cattle.

32477. In your retired life, are you going to devote any of your time to uplift the present deplorable condition of the cattle in your part of the country?—I intend to do something, but I am growing older now, and I do not think I can be very active.

32478. I see that in the list of gentlemen that you mention you include the name of one of our colleagues, namely, Sir James MacKenna, as deserving of compliment. May I know what part of his work you appreciate?—He has published a report on the Agriculture of India for 10 years from 1905 to 1915, and I quite agree with what he has stated in the report. At the end of the report, he has stated one motto, that the department is for the people and for the interest of the people and should work for the people. It is this which impressed me very much.

32479. You are going to be converted to that ideal at this age?—Yes.

32480. *Sir James MacKenna*: How is it that you take such a keen interest in agricultural and rural problems?—I was practising as a pleader for many years, and I sympathise with the condition of the agriculturists. Of course, I am for the good of the people.

32481. You think you are going to do more good to the country as an agriculturist than as a lawyer?—Yes, if I am able to do so.

32482. Do you write often to the Director of Agriculture?—Yes, sometimes I know Mr. Plymen.

32483. Fairly frequently?—Yes.

32484. And he writes you long replies, I suppose?—Yes.

32485. *Mr. Calvert*: I see that you make a very sad confession. You plead guilty to neglecting your duties as Director of a Co-operative Central Bank and not supervising the primary societies?—Yes.

32486. Why did you neglect this important duty?—I am simply a Director I admit that a Director ought to take more interest, that he ought to go to the villages and teach the people better methods of living, and so on. But that requires moving from one village to another, and I am getting old and cannot do so.

32487. You are really too busy?—Not too busy, but really too old. I have to do other work.

32488. *Sir Ganga Ram*: Have you stood for the Legislative Council at any time?—No.

32489. Or for the Legislative Assembly?—Not recently. I stood 3 years ago, but I am a moderate and as it was during the non-co-operation agitation I did not get many votes.

32490. The country has lost the benefit of your advice; you could have done good service?—I have many other things to do.

(The Witness withdrew.)

The Commission then adjourned till 11 *a.m. on Thursday, the 27th January,* 1927.

Thursday, January 27th, 1927.

NAGPUR.

PRESENT :

The MARQUESS of LINLITHGOW, D. L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.

Sir JAMES MACKENNA, KT., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.

Professor N. GANGULEE.

Dr. L. K. HYDER.

Mr. C. U. WILLS, I.C.S.

Sir SHANKAR MADHO CHITNAVIS, KT., I.S.O. } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S.

Mr. F. W. H. SMITH. } (*Joint Secretaries.*)

Mr. M. R. DOKRAS, Pleader, Chandur, Amraoti District.

Replies to the Questionnaire

QUESTION 2—AGRICULTURAL EDUCATION.—(i) No. Because at present there is only one agricultural college for the whole of the Central Provinces and Berar in Nagpur, and two middle schools where agricultural education is given—one at Chandkhuri in the Raipur district and the second at Powarkhera in the Hoshangabad district. There is not even one agricultural school in Berar at present.

(ii) There is urgent need for extension of teaching facilities in all districts of Berar.

(iii) Yes, because they would know the agricultural classes; and also their wants and would be able to command confidence in their methods of teaching.

(iv) The attendance is not as numerous as I would expect. The reasons are as follows :—

(1) The profession of agriculture has not yet risen in the estimation of the general public.

(2) The schools are yet quite new to the people and the farmers have not yet grasped the importance of and the benefits to be derived from agricultural education.

(3) They are situate at great distances from each other. They should be opened at every big town and as soon as possible agricultural education should be made a part of the present curriculum of the primary schools in the whole of the Province. Suitable text-books should be drawn up, giving simple truths about agriculture in an interesting and practical manner. The students should also be given practical training in agriculture according to their age. This would help to take away the defect in present education, which makes students unwilling to resort to any practical agriculture and labour in their own fields when they are at home.

(v) At present, the main incentive is the lure of Government service. It should really be one of turning himself out a good and efficient farmer and earning money and happiness for himself and his family by profitable cultivation which should be intensive and diversified so as to support him in all times and seasons.

(vi) It is not true for colleges but it is true in the case of the 2 schools mentioned above.

(vii) Modifications in the light of the remarks given in answer to (iv) above are suggested.

(viii) Every school should have a school farm or, if this is not possible, at least a school plot where practical lessons in agriculture can be given to the students. These plots and farms would provide a part of nature study and the students should be taken out at least once a week, weather permitting, for small trips for lessons in nature study, which is and essential part of all primary education.

(ix) Government service.

(x) By opening Government demonstration farms at every big town in each taluk where they and their parents can see the benefits and economic gains from improved agricultural practices and intensive farming.

(xi) Not any that I know of.

(xii) Cinema shows and night classes providing agricultural education in vernacular to well-to-do peasants may help to popularise adult education in rural tracts.

(xiii) Such a scheme should consist of:—

(1) All primary schools to be made to include practical agricultural education in the curriculum and each of them be provided with a school farm or plot.

(2) Opening of Government demonstration farms as suggested in (x) above.

Such a scheme should be administered by the District Councils and financed by these bodies with generous Government grants as regards the primary schools. As regards the demonstration plots, these should be administered and financed by the Government through the Agricultural Department.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Formation of Agricultural Associations, Seed Unions, Seed Farms and opening of demonstration farms by Government, as well as the appointments of Agricultural Assistants each in charge of two taluks, have been successful in improving and in influencing the practice of cultivators.

(*b*) Such demonstrations should be held near fairs, bullock races and other places where people collect for some such object. Their number should be increased. They should be well advertised beforehand. It is very necessary for increasing the number of such demonstration that the staff of the Agricultural Department should be increased. The present thinness of the staff makes it very difficult for an agriculturist even to meet an Agricultural Assistant once in his life.

(*c*) Such expert advice should be followed on demonstration plots and other plots of selected agriculturists and the results brought to the notice of the public by appointing a special day for showing to all neighbouring cultivators the difference resulting from the change. Example is always better than precept.

(*d*) One such striking instance of the success of demonstration and propaganda work is the spread of *roseum* cotton seed in Berar in the last ten years through the Seed Unions, Seed Farms and Agricultural Associations working under the advice of the Agricultural Department of the Central Provinces and Berar.

QUESTION 4.—ADMINISTRATION.—(*c*) (i) The present staff of the Agricultural and Veterinary Services is too small. It should be increased as soon as possible to twice the present number. Junior officers of the Agricultural Department who have spent most of their services in wheat tracts should as far as possible not be transferred to cotton tracts and *vice versa*. As regards the Veterinary Surgeons, there should be one Surgeon attached to every dispensary so as to be available to the public at any time and he should not be given any touring work. The touring Assistant Surgeon should be separate from the one in charge of the dispensary at headquarters. At present, one Surgeon alone is in charge of the dispensary as well as the touring work which is also compulsory for 10 days in a month.

Some important cases cannot therefore be fully attended to and many cultivators coming from villages to dispensaries are sorry to find the Surgeon away on tour and have to go back without any help or advice. The inspecting staff is too much for the present number of dispensaries and the chief work by Inspectors done at the time of inspections consists in making account of all the medicines spent and verifying the balance. I am of opinion that the posts of Inspectors should be abolished and the present Inspectors appointed to take charge of dispensaries at big towns thus releasing some of the staff to take charge of new dispensaries. The Deputy Superintendents inspect the dispensaries twice a year and that is sufficient to check the work of the assistants in charge.

(ii) Rates of transport of all agricultural produce by railways should be cheaper than the common rates and the railways should provide better facilities for transport of cattle. The present wagons do not serve the purpose well and there is every danger to the animal when in the wagon while in transit.

(iii) Roads are very few in Berar as compared with its income and extent. The number of metalled roads should be increased as soon as possible to facilitate the transport of cotton to gins from inside villages.

(iv) The Meteorological Department is at present of no service to the general body of agriculturists. If the increase of stations is necessary for its practical use, they should be increased and their bulletins published in every tahsil office or post office in the rainy season.

QUESTION 5.—FINANCE.—(*a*) The formation of huge co-operative associations of growers of each crop like cotton, etc., each distributing the sale of their produce over the 12 months in the year will enable the farmers to get average price for their produce and also finance them in all the months including the rainy season. This will avoid the dumping of the agricultural produce on the market all at once and thus lower the rates in the season of gathering of crops. The associations will be able to make better arrangements for housing the commodity till it is required for sale and they will also be able to get better rates for the produce through their expert selling officers.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes for borrowing are:—

(1) Want of prudence due to illiteracy created by having a lot of money at a particular time of the year and nothing at all at other times.
(2) Bad social customs such as marriage expenditure out of proportion of the means of each.
(3) Uncertainty of rainfall.
(4) The prevalence of the gambling habit which is found in almost all villages of Berar where youthful agriculturists spend all their annual income in one or two sittings and many times their whole estate in one or two years.
(5) The rule of Hindu law which gives every person a right by birth in the family estate. This fact is an incentive to dishonest moneylenders to get pro-notes, etc., for loans advanced to boys who have just reached maturity who not knowing the difficulty of acquiring an estate by labour waste the same as easily as they got it.
(6) Love of litigation many times undertaken without any chance of success only for the sake of obstinacy and going through all the three courts of law, first Court, Appellate Court and High Court.
(7) Lack of facilities for honest and safe borrowing.

(ii) Village moneylenders and co-operative credit societies in some of the villages and in some cases the cotton brokers who advance money to their customers in the rainy season with the intention of getting interest as well as brokerage on cotton carts in the crop season.

(iii) Illiteracy; successive bad seasons due to uncertain rainfall; optimism, that the next season will be good and he will be able to pay off at once the whole debt, created by the high soaring price of cotton in some seasons; and facilities afforded by the village *sowcar* for further credit with the hope of swelling the debt and swallowing the whole estate when repayment becomes impossible.

These are the reasons that prevent repayment.

(*b*) Spread of more liberal, general as well as agricultural education will lighten the burden of agricultural debt. No special measures are necessary.

(*c*) No.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) No person should hereafter be allowed to partition a field in parts of less than 5 acres each. The breach may be made punishable under the Land Revenue Code and a fine equal to that imposed in cases of non-agricultural uses should be levied from the defaulters.

(*b*) Consolidation should not be attempted.

(*c*) No.

QUESTION 9.—SOILS.—(*a*) (i) Soils can be improved by (1) drainage, simple or tile or boulder, (2) levelling, (3) green manuring, (4) rotations, (5) allowing land to be fallow for one year.

(iii) Levelling, *bunding* and not allowing land to be fallow in the rainy season.

(*b*) A field of 13 acres near Kurha, Chandur taluk, Amraoti district, was levelled and *bunded* about 12 years ago by Mr. Lacchiramsingh of Kurha at an expense of about Rs. 3,000 and its soil is now in very good condition as erosion is fully checked. Rain water goes out only from a patch of land 5 feet broad.

QUESTION 10.—FERTILISERS.—(*a*) Yes. Soil surveys with special reference to the constituents of the typical soils of a taluk should be undertaken and records kept for inspection and free or cheap analysis of soil of any field should be arranged for by Government at the instance of any cultivator applying to get the same done. By this means it would be easy to know how a particular field can be economically fertilised by addition of the deficient plant foods to its soil. Government farms and Association demonstration plots should be utilised for trials of complete fertilisers found out by the help of the above analysis suitable for the crops to be grown on the same. The results should be shown to the surrounding cultivators in the field itself and made known to the general public by distribution of leaflets embodying the results of the trials. Shops where such complete fertilisers will be sold should be opened in every taluk place. Greater use of the natural manures, cowdung and urine is already being made by the general body of cultivators, but they should be persuaded to adopt the dry earth system of urine conservation even in rainy season.

(*b*) The fertiliser dealers should be made to guarantee the proportion of available plant foods in their stuffs and if any are found below the standard guaranteed after analysis by Government experts, the dealers should be prosecuted for cheating or under some special law enacted for the purpose.

(*c*) As shown in latter part of (*a*).

(*d*) Not known.

(*e*) It is not sufficiently investigated.

QUESTION 11.—CROPS.—(*a*) (i) The existing crops can be improved by seed selection (using such seed as is more prolific and suits the local soil and seasons and rainfall), good manuring and using due spacing.

Cotton is the main cash crop in Berar. The present seed mainly consists of *roseum*, a short stapled variety and an improvement in the strain so as to produce a good stapled variety with equal yield is necessary. Near about Arvi in Wardha district and at Tewsa in Amraoti district some local farmers have by selection improved the mixed local variety and its ginning percentage is now very high, as high as 40 per cent and more than the *roseum* variety which has recently deteriorated and gives only 36 per cent of lint. The seed of this mixture consequently commands fancy prices and sells at more than double the market price of ordinary cotton seed. Even the yellow flowered trees of this mixture produce seed cotton which has a high percentage of lint and an attempt to separate them and found a new variety having long staple and better outturn seems possible with the aid of expert departmental officers. An effort was made by the writer to send some of this seed to the Government farms for sowing to find out the good strains through the Deputy Director of Agriculture of Amraoti but as the Director of Agriculture did not approve of the plan the proposal was dropped. The Assistant to the Cotton-breeder at Dhulia (Bombay Presidency) has taken some bolls from this cotton plant this year.

(ii) Ground-nut is a new crop which is well adopted to Berar soil season and deserves encouragement at the hands of the department. It produces good fodder and leaves the land richer by the addition of nitrogen. It requires less labour and very little weeding and becomes ready in 100 days which is the period of good rains also. It can grow comparatively well in light soil and gives a

good outturn in good soil as high as 2,000 lbs. per acre being known to the writer. Especially in these times of cheap cotton, ground-nut should replace at least half of the present acreage of cotton. In Khandesh, it has already encroached to that extent on cotton cultivation and the cultivators in those parts are not so hard hit by the fall of cotton prices as they have got ground-nut to rely on. The writer has introduced the small Japan variety in Chandur taluk since 1916 in which year he sowed a field of 28 acres under ground-nut and the seed he distributed has steadily increased in villages having light soils, *e.g.*, Amla which has about 1,000 acres under ground-nut this year. The only difficulty is the high price of seed in the first year. The trouble about pigs can be done away with by planting a large acreage in every village, cultivators in Amla now do not keep any watchmen on any of the ground-nut fields.

(iii) Seed distribution can be well managed through Agricultural Associations which are in existence in almost every taluk in the Province.

(iv) Damage by wild animals is only found in villages which are near reserved forests and it can be lessened by generous grant of licenses for firearms in such villages.

(*b*) No.

(*c*) Mentioned under (*a*) (*i*).

QUESTION 12.—CULTIVATION.—(i) Generally, cultivators harrow their field with a harrow dragged by one pair of bullocks. The first harrowing is done by a bigger harrow drawn by 2 pairs of bullocks and the second by the small harrow as at present. This will give greater mulch than at present and the cotton stalks also will be completely uprooted from the field by the deeper cultivation. Uprooting the cotton stalks by hand and then harrowing gives still better results and also checks the spread of certain diseases such as root-rot. The field also becomes free from living plants eating up nourishment. Because of harrowing you have to wait till the plants are dried and can be cut by the harrow. The expenses of uprooting this side are about Rs. 2 per acre but they more than balance the advantage from easier harrowing and better crops next year.

(ii) I would suggest sowing a mixture of *juar* and *urid* (*juar* 2 lbs. and *urid* 6 lbs.), per acre instead of the present mixture of *juar* and *mung* (*juar* 3 lbs. and *mung* ¼ lb. per acre). The greater incidence of *urid*, a leguminous crop, improves the soil and benefits the crop of the next year and, *urid* being an early maturing crop, *juar* suffers no damage by the *urid* crop though sown together, *juar* being the only crop growing in the field after 2½ months of sowing. *Mung* gives better fodder than *urid* and therefore some area may still be sown with the *juar*-*mung* mixture as at present, *mung* being increased to 1 lb. per acre. The writer does not approve the idea of the local people who sow *tur* lines in every cotton field. *Tur* should only be sown in fields of cotton which do not produce cotton plants higher than 1½ feet, the better fields being sown with cotton alone. The present rotation is *juar* and cotton in alternate years in fields which are not manured, manured fields being sown with cotton successively for 3 or 4 years. I would suggest a rotation of *juar* acreage ⅓rd, ground-nut ⅓rd and cotton ⅓rd, the cowdung manure being given to ground-nut and some fertiliser (complete) to cotton after sowing, *juar* being grown on the residue of the manure given in these 2 years.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—*Juar*: Smut in *juar* can be controlled by saturating the seed in a solution of coppersulphate of the required strength, but the parasite plant known as *taloop* in these parts cannot be controlled by this method or by any method known to the writer.

Cotton: Wilt can be controlled by rotation, and by planting yellow flowered varieties and these methods are efficacious.

Root-rot: Very few people know that this is a disease caused by a fungus in the soil and can be controlled only by rotation, uprooting the stalks and burning them.

Boll-rot: There is no measure by which boll-rots are protected in these parts.

The cotton caterpillar made havoc in some villages of this taluk in the growing season of 1925 and no measure efficacious and practical was found for ridding the fields of this pest that year. The department suggested the method of catching worms by hand and trampling them or drowning them in

a pot full of kerosine and water but this is not practical when fields after fields are affected. Some sort of dusting device and a suitable poison to dust these insects to death can be the only practical solution as is done in America for the boli weevil.

QUESTION 14.—IMPLEMENTS.—(*a*) In the opinion of the writer, the experiments with tractor ploughing are not popular in this side of the country because people do not generally consolidate the soil after ploughing the same, but watch till the rains do the same and thus have to wait for a long time to sow after the coming on of the monsoon. This trouble will be avoided if new implements of the "cultipacker" type which are available from many firms are more generally introduced and people made to understand the necessity of again packing the soil after ploughing so as to make a proper seed bed ready to be sown with the first approach of the monsoon.

(*b*) (1) Opening of demonstration farms at every tahsil town and the use of such improved implements on these farms.

(2) Opening of shops by Taluk Agricultural Associations where such implements and their spare parts can be made available for ready purchase by the cultivators at the price of the manufacturer, the commission being always sufficient to make up the expense of bringing the same from the manufacturer and keeping it in stock for sale.

(3) Opening of mechanical schools where mechanics who can do small repairs to agricultural implements can be trained. Every town should thus have its own shop of mechanics ready to set right the machines working in the town. Want of such mechanics is at present at the root of the unpopularity of machines in agriculture, because the farmer who buys a valuable machine becomes the laughing stock of the whole village when the machine becomes idle through slight disrepair and it is not possible to find out any one near at hand to set matters right.

(*c*) The high railway freight which comes to nearly 12 per cent of the value of ploughs bought from Messrs. Kirloskar Bros. in Satara district to Chandur by railway is a difficulty in the matter of the distribution of agricultural implements for sale throughout the country. It should be reduced to 5 per cent or even lower if possible.

QUESTION 15.—VETERINARY.—(*a*) It should be under the Director of Agriculture.

(*b*) (i) The veterinary dispensaries are under the control of the District Boards. This system works well.

(ii) The need for expansion is not yet keenly felt because people are not yet habituated to their use. But as they will gradually know their advantages, the expansion would be necessary and would be taken up.

(iii) Absolutely not.

(*c*) (i) Agriculturists do not yet make full use of the dispensaries but it is due to their ignorance. As education would become more general, more resort would be taken to cure the animals through dispensaries.

(ii) There are no touring dispensaries in this district. The Veterinary Surgeon goes on tour for ten days in the month and the dispensary is left in charge of the compounder who is sometimes quite new to the work. Cases coming in the Surgeon's absence cannot therefore be properly treated and people become dissatisfied. This is one of the important reasons why fuller use is not possible of these dispensaries. The touring assistant should always be different and the dispensary should not be allowed to be without a doctor in charge.

(*d*) I would not advocate legislation dealing with any of the subjects, for as yet the main body of cultivators are not sufficiently educated to understand the importance and necessity of such restrictions.

(*e*) No.

(*f*) No obstruction in the way of popularising preventive inoculation. No fee is charged.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) The grass and fodder including straw of cereals and stems and leaves of pulses and the grain and corn used as cattle food in this Province should be analysed and their nutritive constituents as cattle food determined by Government experts. Suitable combinations including addition of mineral constituents may be suggested for feeding milking

cows and buffaloes and dry cows and buffaloes and growing calves and bulls separately. Government should encourage shopkeepers who will sell such combinations of feed guaranteed to contain sufficient nutriment for the above animals by exempting them from income-tax and other facilities.

The use of silos should be made compulsory on all Government farms operating in the Province so that the people in the surrounding villages may know the advantages arising from silos.

(*b*) The forest area reserved for grazing is overstocked with cattle in the rainy season and consequently the pasture is not sufficient for all cattle admitted in the forest. The animals do not get sufficient grass to eat and the overcrowding also results in the outbreak of contagious diseases in the forest area. The number of animals should therefore be restricted to that which can be properly fed on the acreage available.

(*c*) May, June and July. Four more weeks elapse before young growing cattle begin to thrive.

(*d*) Growing fodder crops such as thick *juar* for fodder may be practical but is not practised by any cultivator this side as yet.

(*e*) By showing the benefits of the improved methods on Government cattle-breeding farms and dairies.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*b*) Poultry keeping would be the best subsidiary industry which should be adopted by agriculturists.

(*c*) Want of suitable poultry farms where good stocks are available for sale and also want of instruction in the usual school curriculum as to how to manage poultry farms.

Suitable Government poultry farms should therefore be opened at every district place at first and gradually at every tahsil town where good utility poultry breeds would be available for purchase by the agriculturists, and also where instructions can be given to pupils in the business of poultry management.

QUESTION 20.—MARKETING.—(*a*) No.

Cotton: There is a Cotton Market Law in force in Berar, but it does not provide for the appointment of any members from the agriculturists on the committees which manage the cotton markets. The law should therefore be modified and suitable representatives from the agriculturists be nominated to serve on such committees either through Taluk Agricultural Associations or directly through the Deputy Commissioner.

(*b*) *Cotton Market*: There are no facilities for the cotton cultivator to sell his produce slowly so as not to glut the market in two or three months by the whole produce. This glutting forces the prices down to their lowest level at a time when most of the produce is sold by agriculturists to merchants. This can only be remedied by the establishment of a large number of co-operative marketing societies for cotton as are found in the American States where farmers can take their bales of cotton as they are pressed to such societies to be classed and stored by such societies which advance them a fixed percentage of the value for their current expenses at low rates of interest and by slowly selling the cotton at appropriate times of the year manage to get the best average price for every class of cotton stored with them by each of their members. Every effort should therefore be made to bring such societies into existence as soon as possible.

(*d*) Yes. They are very necessary and cotton market news, Indian as well as overseas, crop returns and complaints about Indian produce should be circulated free to every cotton market and tahsil office to be published therein.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The existing system of elementary and middle school education creates an indifferent and many times an aversion in the minds of the pupils for agricultural work as there is no reference to such subjects and their importance in the school curriculum. The curriculum should therefore be changed so as to include lessons on agriculture and its elementary principles slowly developing the theme of agriculture in all its branches, theory as well as practice, as the students advance in the school courses. Such students will be gradually trained to take greater interest in agriculture and its practices and will not remain disinterested as the students of the present day. The agricultural course should be compulsory and included in all the

elementary and middle school courses. But the higher and collegiate education may be divided into several branches as at present including agricultural and mechanical side for those who want to specialise in the same. More funds should be spent over agricultural teaching schools and the training of teachers for such schools.

(*b*) (i) The above method will improve the culture and ability of agriculturists of all grades while retaining their interests in land.

(ii) The present compulsory education in the rural areas being of the old type without any reference to agricultural subjects does not satisfy the pupils of such areas and their guardians are rather unwilling to send their wards to such schools.

(iii) Parents come to know of the ineffectiveness of such education to fit the students for the profession of agriculture and therefore the number of boys who pass to the higher classes gradually diminishes till very few pass the fourth class.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Institutions like the Social Service League of Bombay should be established through Government efforts in all important villages and the members of league slowly trained to improve the hygiene in the rural areas and establish crêches for children of the mothers who have to go in the fields for weeding cotton, picking and other field work, keeping their infants in the care of children aged 3 or 4 and sometimes none at all, and do such other works as would promote the general well-being of agriculturists.

(*b*) Yes.

Scope: Discovering the main features of village farming, *e.g.*, the exploitation by moneylenders, the thriftlessness of the farmers, absence of supplementary occupations, ignorance of improved methods of cultivation, very poor livestock, litigiousness and absence of co-operative facilities.

Methods: Appointment of influential committes from among agriculturists and experts in co-operation.

Oral Evidence.

32491. *The Chairman:* Mr. Dokras, you are a pleader of Chandur, District Amraoti, Berar?—Yes.

32492. We have your note of the evidence you wish to put before us; would you like to say anything at this stage, or shall I ask you questions?—In view of the Conference which is to take place to-morrow between this Commission and the Local Government, I should like to say this: Last time education and agriculture were under two separate Ministers; I think, if possible, they should, being allied subjects, be placed under the same Minister this time; that is the main thing I should like to impress on the Commission.

32493. What is your own association with agriculture? Are you a farmer?—Yes, I cultivate nearly 200 acres belonging to me and I have 200 acres on lease.

32494. Is that land cultivated by hired labour ?—Yes, all hired labour.

32495. Do you manage that yourself?—Yes, I have been farming since 1916.

32496. Are you practising at the Bar at the moment?—Yes.

32497. Do you find you can do both?—Yes.

32498. What about the area that you lease?—I am taking that on lease because the superintending charges are the same.

32499. What type of land is it that you farm yourself?—Black cotton soil; some of it light and some of it is very good.

32500. Have you any irrigation?—No.

32501. What are your principal crops?—Cotton and *jaur*, and a little wheat.

32502. Where do you market your cotton?—At the Chandur cotton market.

MR. M. R. DOKRAS.

32503. Are you satisfied with that market?—No. At present the members of the market committee are nominated by the Deputy Commissioner through the Tahsildar; there are on that committee no representatives of the agricultural classes. The law excludes representatives of the agricultural classes from that committee; I submit the law should be changed so that there should be representatives of the sellers and the farmers on the market committee.

32504. Do you not think it would be very difficult at this stage of development in the Province to find farmers who could attend the meetings and who would have knowledge and experience?—There is an Agricultural Association for the taluk; if they inform us, we will put in two members who will be willing to attend; I think there would be many willing to do so.

32505. Failing the existence of such members, do you think the Agricultural Department might have a representative to represent the cultivators' interests?—Of course that would be better than the present state of things. Last year we subscribed nearly Rs. 100 from the Agricultural Association to provide for telegrams being sent from the Bombay market; it would, of course, be of immense benefit both to buyers and cultivators to know the Bombay rates before the market opened; but this year, though I pressed for the public exhibition of the rates on a board in the market, the merchants, thinking their secrets would be divulged and they would not be able to take advantage of the market, opposed it. If there cannot be representatives of the cultivators on the market committee at present, a representative of the Agricultural Department would do something. The representatives at present nominated by the District Commissioner are mainly merchants and are really representatives of the ginning factories.

32506. You make various suggestions of a constructive nature for the extension of the agricultural services and for the extension of the system of agricultural education; have you thought at all as to who is going to pay for all this?—Of course, the provincial budget.

32507. Would you suggest more taxation?—In the present state of things that is not possible, because the budget this year will be a deficit budget, and the state of the farmers in the Province is very bad on account of the price of cotton having gone down.

32508. So that I judge that your scheme must be to divert funds at present being spent in other directions, towards agriculture; is that your idea?—Yes; for example, in our taluk there are three Sub-Inspectors working under the Excise Department, while there is only one Agricultural Assistant for two taluks; the Agricultural Assistant has to look after an area of nearly 60 miles long and 30 miles broad, while the Excise Inspector has an area of only about 10 miles square; if the number of excise officers were reduced and the money diverted to agriculture, I think more good would be done to the cultivators.

32509. *Sir Henry Lawrence*: What would be the loss in excise revenue?—There would be no loss; the Sub-Inspectors only do checking work, a sort of C.I.D. work.

32510. *The Chairman*: You suggest that primary schools should be made to include practical agricultural education?—Yes, that is the main thing I suggest in the beginning.

32511. Do you not think the primary schools are best left to teach literacy to small children?—But agriculture is the only industry in the Province; practically 90 per cent of the people in Berar live on agriculture; it is not at all industrial; therefore agriculture is as necessary as literacy and even compulsion should be introduced.

32512. Do you not think literacy itself would be a great contribution towards agricultural efficiency?—But we are finding that the students who have been taught during the last fifty years are not willing to do manual labour; because they are literate, they think they should not touch agricultural implements. That would be avoided if from the beginning children were taught agriculture and learned that agriculture is respectable.

32513. I gather that it is your view that the Agricultural Department has done good service to the cultivator in certain directions?—Yes, but I think it could be enlarged. The cotton at present grown in Berar is *roseum* cotton; but we are now

finding that *roseum* is deteriorating, that is to say, the lint percentage is declining. I am cultivating other varieties which are not fixed varieties, but are mixtures; during the last two years they have given from 40 to 42 per cent of lint. As I mentioned in my note, I made an attempt last year to send those mixtures to the Agricultural Department with a view to finding out the more prolific and better varieties; but it was not done because the Agricultural Department did not think it a good thing to experiment with these mixed varieties. But I submit that when there is an Agricultural Department with an Economic Botanist and other officers, this sort of mixture should be investigated, and that as the main variety of *roseum* has decreased in lint percentage such other good varieties as are in existence should be fixed, and further investigations should be undertaken with regard to them so that the good strains may be selected fixed and distributed. I myself have not put any land under *roseum* for the last four or five years, mainly because I get 40 per cent of lint from the other varieties, and from one variety I can even get 42 per cent. Some people say it is rather a short staple cotton, but the cotton grown in Berar is mainly short staple; the *roseum* staple is, I think, nearly 4/8th inches so that the short staple is not a very great difficulty; I find the lint percentage of my mixtures is greater and therefore I think they should be investigated and taken in hand.

32514. On page 480 you suggest that the railway freight rates for agricultural produce should be reduced. Is it your idea that the railways ought to carry agricultural produce at a loss?—Not at a loss, but at least they should not make any profit. 12 per cent of the price at present is the freight that we have to pay; I think it might be reduced to 5 per cent.

32515. Do you know at all what proportion of the total carrying trade of the Indian railways is in agricultural produce?—No, I am sorry I do not.

32516. If you were concerned with this matter from the angle of the railway, you would have to pay great attention to that, would you not?—Yes, I should.

32517. Will you just tell the Commission what your own experience of co-operative societies may have been?—I am not connected with co-operative societies at all, but one thing I can tell you that at present the societies have rather degenerated; they have practically supplanted the moneylender and have become a sort of moneylending business. If a man wants Rs. 10,000 or Rs. 20,000, he gets nine more people and between themselves they get Rs. 20,000 from the Central Bank. The main purpose of co-operation is that only the necessary amount should be given to the members and expenses should be curtailed; but those principles are not properly taken into consideration. What has happened is that the moneylending business has been transferred from the Marwari and other sorts of moneylenders to the co-operative society. The main consideration that I should like to impress upon the Co-operative Department is that they should see that the co-operative societies look to the interests of the members and avoid waste. If a man requires Rs. 1,000 for a marriage, he should not be given that sum if his social status does not justify that expenditure; but that is not taken into consideration by the co-operative societies; they give credit practically up to the full value of the borrower's estate, and then law suits are instituted. As a pleader, I know that co-operative societies very often execute their decrees onwards in the courts as creditors. The co-operative societies do not perform their main function.

32518. On page 482 of your written evidence, you suggest the sowing of a mixture of *juar* 2 lbs. and *urid* 6 lbs. instead of the present mixture of *juar* 3 lbs. and *mung* ½ lb. per acre. Have you tried that mixture yourself?—Yes. I have been trying it for the last three years.

32519. Are you satisfied with it? Yes; the next year's crop is better after this *urid* mixture than after the *mung* mixture.

32520. Have you attempted any mechanical ploughing on your own estate?—Yes; I have used "the Turnwrest" plough.

32521. With bullocks?—Yes, with 4 bullocks. But I think many people do not understand the importance of consolidating the soil after ploughing. The soil requires to be consolidated even after it is ploughed with an iron plough. In these parts, the people do not understand this aspect of cultivation and hence they suffer. They have to wait till they get rain for the soil to consolidate and then they sow. I, therefore, say that after ploughing there should be harrowing with the help of an instrument called the cultipacker so that the soil may be consolidated and then the crops may be sown with the fresh approach of the monsoon.

32522. How many bullocks have you got on your estate?—I have 16 pairs.

32523. Do you have difficulty in feeding them in the season of fodder shortage?—have ample fodder; I always store it for one year in advance.

32524. How do you store fodder?—In heaps.

32525. Dry?—Yes, dry. I do not have silage.

32526. You are like many other people who have come before the Commission to give evidence. You are strongly in favour of silage; you go so far as to say that the use of silage should be made compulsory?—That is the only way by which the cultivators can be made to see the benefit of it.

32527. In spite of your confidence in silage one finds that a progressive and well-informed gentleman like yourself refuses to make any silage?—But we want an engine for the purpose; without an engine the silage cannot be made and I have no engine at present.

32528. Are you breeding any of your own bullocks?—Yes; I even sell them.

32529. Have you got racing studs?—People purchase the bullocks from me and some use them for racing. They are fast trotting bulls and so they are often bought for that purpose.

32530. *Sir Henry Lawrence*: What would be their price?—Generally I get Rs. 500 per pair and in a good season I can get something like Rs. 700 or Rs. 800.

32531. *The Chairman*: I see you are interested in poultry too; is that for egg laying or cock-fighting?—It is only for egg laying. There was tick trouble in my cattle and my herdsman said that if I kept poultry that would disappear. Being a Brahmin I cannot keep poultry for my own use. So in order to avoid the tick trouble in cattle I am keeping poultry for the last three years. For some time I was having country bred fowls but now, when I know that any way I have to keep poultry, I started keeping a good breed.

32532. Have you had a great deal of trouble with the chicken ticks?—No.

32533. Do you use any special perches?—Yes; I have got a special perch, a bamboo resting on supports, with a tin can full of rock oil and water.

32534. I dare say you know the position: It is that while chickens devour the ticks when they go out in the day, the ticks devour the chicks in the night?—I do not think so.

32535. *Prof. Gangulee*: Do you sell your poultry?—I sell only the eggs.

32536. *The Chairman*: Have you employed any trained managers on your estate?—No; I employ only the ordinary people who are not educated.

32537. How many days in a week can you find time to look to the business of your estate?—I go there at least once a fortnight; in the rainy season I go there at least once a week.

32538. So that you must depend upon your servants entirely?—Yes; but I employ only such people as can manage according to my instructions.

32539. Do you attach importance to a scientific agricultural training in your management?—Yes; I would be the first man to advocate it. I myself graduated in botany and zoology from Wilson College, Bombay, and I know the importance of science and scientific management in agriculture; but then it is very difficult to get such people at present.

32540. Otherwise you would be inclined to look for managers from amongst the students of this College?—Yes; I would be the first man to look for them.

32541. *Prof. Gangulee*: Why do you think that *roseum* cotton is deteriorating?—Because it has less percentage in lint. I have enquired from many people and they are of the same opinion.

32542. Have you asked the Director of Agriculture about it?—I had a talk with Mr. Allan when he came to Chandur, where there is a demonstration plot.

32543. From where do you get your seed for your cotton?—There are two men one in the Arvi tahsil and one in the Chandur tahsil who select their seed. They have been doing so for the last twenty or twenty-five years and their cotton has a ginning percentage, at present, of 40 per cent. I have got that seed with me.

32544. I want to know whether you get any seed from the Agricultural Department?—I got seed of *roseum* in the beginning, but as it has deteriorated I have discontinued it.

32545. Do you get any other seed from the department at present?—No.

32546. On page 480 you say, "facilities afforded by the village *sowcar* for further credit with the hope of swelling the debt and swallowing the whole estate when repayment becomes impossible." Would you amplify that a little?—Supposing a man has got a field worth Rs. 2,000. The creditor gives the man advance after advance till the whole debt with interest accumulates to Rs. 2,000; then he brings a suit, repayment becomes impossible, the land is attached by the court and the creditor himself purchases the land for that money. There are moneylenders in my part of the Province who actually come to the houses of the people and advance money. One reason for this is that in 1918-19 cotton reached very high prices and the value of land went up. That was why people were very much after Berar fields and moneylenders came and advanced money, with the result that repayment afterwards became impossible and lands passed into their hands.

32547. When you get your seed, do you distribute it to your neighbouring farmers?—Yes, to as many as can buy from me.

32548. For cash?—Yes; I do not do any moneylending or seed lending business.

32549. In answer to a question put by the Chairman you said that you had about 200 acres of land and you utilised hired labour. What do you pay the labourer?—Rs. 150 per year. I pay them in kind and the value of it comes to Rs. 150 per year.

32550. *Mr. Calvert*: Could you let us know to what extent the land is passing into the hands of the moneylenders?—I cannot give the extact figures. But I know that in villages round about Chandur at least 10 boys have been ruined by such advances by the moneylenders and have become insolvents.

32551. You think it is taking place to an appreciable extent?—Yes. Supposing a man aged 40 or 50 dies and he has got a son aged about 18, the boy gambles and spends the whole amount in one sitting. I could name instances. That is the first thing that should be remedied, and these youths should be protected.

32552. Would you be in favour of something on the lines of the Punjab Alienation of Land Act?—I am against such an Act, because there are many people who are intelligent and do not want this sort of help and if we enact a law of this nature, we will be curtailing a great deal the rights of all. Therefore, I suggest that this evil of gambling should be put an end to and there are other ways of doing it; we can make the Gambling Act, now applicable only to big towns, applicable to all the villages.

32553. *Sir Henry Lawrence*: What kind of gambling are you referring to?—They play with cards, what we call *uthar* and also *minaf*. I do not know much about these things. Some times they bet something like Rs. 1,000 at one sitting. There are players and sub-players. There are many youths who have been ruined within one year. The moneylenders take pro-notes from these youths for Rs. 1,000 although they actually advance Rs. 500. That means that he has a chance of getting Rs. 1,000 at one sitting and he borrows Rs. 500 although he gives a note for Rs. 1,000. That is the sort of evil that is going on. I wrote my replies to the Questionnaire mainly with the idea of doing something for these persons and that is the most baneful evil that is at present going on.

32554. Do they gamble on rainfall?—Not the cultivators, only the Marwaris in Amraoti and Akola.

32555. And do they gamble on horses?—No; not on our side.

32556. *The Chairman*: And bullocks?—No; it is on cock-fighting.

32557. *The Raja of Parlakimedi*: Do they not gamble on bullock races?—No; only prizes are given sometimes. That is only a question of enhancing your prestige if your pair wins.

32558. Buying and selling of cotton?—No; that is trading. The cultivators do not do that; only the Marwaris go in for it. They purchase cotton with the hope of the rates rising afterwards. As I say that is done only by the Marwari moneylenders.

32559. *Dr. Hyder*: Is there no *satta*? Do the moneylenders sit down and take a hand in the game of cards?—No: generally they have to sue such persons who cannot pay. This is all done outside the gambling den so that evidence outside the place may be available in the matter.

32560. *Mr. Calvert*: In Berar do Brahmins lend money?—Brahmins do lend money sometimes; there is no special reason why they should not.

32561. Are they not prohibited by their religion?—No, only Mahommedans are.

32562. I think Brahmins are also forbidden by your *shastras*?—No: I am quite sure about it. We can recover up to *damdopat*. The Hindu law forbids the recovery of interest of more than double the amount of the principal, but it does not forbid moneylending at all.

32563. Does the Usurious Loans Act apply to Berar?—No.

32564. Would you like to see it applied to Berar?—The Usurious Loans Act alone would not prevent this gambling. It may help a good deal. Supposing that a man takes a note for Rs. 1,000 by giving only Rs. 500. In such a case of course something may be done, but the habit of gambling cannot be stopped altogether. That is what I am trying to get at.

32565. *Prof. Gangulee*: Have you tried to apply this Usurious Loans Act?—It does not apply to Berar.

32566. *Mr. Calvert*: In reply to the Chairman you made some rather severe remarks about co-operative societies. Were these remarks based on your own inspection of societies' books?—No, but I am personally acquainted with some of the members. I know some members of societies who have practically become insolvents in three or four years and still have about Rs. 20,000 due on mortgages to the societies.

32567. You say that consolidation should not be attempted. What is your objection?—The objection is that you would have to acquire the land.

32568. Why?—How can it be done otherwise? I have no other idea.

32569. You have not studied how this work could actually be carried out?—Nothing that I have read about it anywhere else indicates that it can be done except by way of acquisition. The penalty that I have suggested is very easy and a very novel one and I think myself that it will put a stop to this evil. Suppose a man cultivates a field of less than 5 acres he should be charged a penalty for non-agricultural uses, so that we practically will get rid of the evil and further fragmentation will be stopped.

32570. *Sir Henry Lawrence*: Are you in favour of the total prohibition of alcohol?—Yes.

32571. How would you replace the revenue that you would lose?—Of course I do not want absolute prohibition at once; it should be done gradually as funds permit.

32572. Would you raise the taxation on other sources to make up the loss?—Yes; if it cannot be managed otherwise.

32573. Do you know what the excise revenue amounts to in this Province?—I think it must be more than one crore; I do not know the exact amount.

32574. It is Rs. 160 lakhs?—Yes.

32575. And the total land revenue is only 50 per cent more?—Yes, the difficulty would be of getting the income in some other way. Still I should think the staff may be decreased. There are three Sub-Inspectors of Excise in each taluk and you can reduce their numbers.

32576. Do you know what the expenditure of the Province is in bringing in these 160 lakhs on excise?—I do not know.

32577. It is 7 lakhs of rupees to bring in 160 lakhs. Is that disproportionate?—We could cut down a part of it and as I have said in my written note we can cut down the post of Excise Inspectors and also the posts of many Sub-Inspectors of Excise. We could then have some money for our Agricultural Assistants. The demonstration that is at present being carried on, by the way, as this question has now arisen, is very meagre. As a matter of fact, the Assistant does not meet many of the agriculturists even once in a year.

32578. Do you think that if you reduced your inspecting staff of excise you would advance the cause of temperance and the prohibition of alcohol ?—That staff does not help in any way in abolishing the thing.

32579. It does not prevent people from illicit distillation ?—That thing of course could be looked after by the decreased staff.

32580. How are you going to look after it if you take away the staff ?—The *patels* can report occurrences and even at present detecting illicit distillation is practically managed by the *patel* and the Sub-Inspector of Excise. The Sub-Inspector alone cannot do anything. The information is given by the *patel* and his subordinates.

32581. *Sir Ganga Ram*: I am glad to see a progressive agriculturist. But after you took your degree in botany and zoology, what use did you make of these two sciences in law? Why did you take to law? Were those sciences useful for law ?—Because the Bombay University had that as an optional subject. I had to pass my B.A. to become an LL.B.

32582. What I meant to ask you was why you picked these two subjects? With what view did you take these two subjects ?—I had to pass the B.A. degree examination, not of course with the intention of going in for agriculture.

32583. Did you make up your mind about going in for law before you went up for your B.A. ?—Yes.

32584. These two subjects were, I suppose, the easy line of least resistance ?—No; that cannot be said to be the the fact in my case.

32585. We wish to bring this to the notice of the University, that you can get through these two subjects very easily ?—No, because I was the first scholar in my college in the two years where these subjects were studied by me. I was also the first scholar in the Wilson College for all the four college years.

32586. You hold 203 acres on lease ?—Yes.

32587. On what terms ?—Nearly Rs. 3,000.

32588. You pay the owner ?—Yes.

32589. Who pays the revenue ?—I do.

32590. Then it costs you altogether about Rs. 4,000 ?—No; the revenue is about Rs. 400.

32591. What is your net profit ?—Last year I had no profit and this year there will be a loss to me, both being bad years.

32592. You cannot make more than Rs. 30 an acre altogether gross ?—In the last two years I could not, but it would be Rs. 25 an acre gross in an ordinary year.

32593. So you make Rs. 5 an acre net ?—Yes, in ordinary years.

32594. You said, I think, that you would be the first man to engage a man from the Agricultural College. Can you afford to engage him if you are not doing well yourself ?—For the last two years the position has been very bad for cotton.

32595. On what pay could you afford to employ students from the Agricultural College ?—On Rs. 50.

32596. Would you have graduates in agriculture or would you have diploma holders ?—I would not employ a fresh graduate. I would get a man who has had some experience of managing an estate.

32597. That is to say, the graduates must first take a training in managing an estate and then come to you on Rs. 50 a month ?—Yes, because I will not be able to entrust the whole management to a *kutcha* man.

32598. What has he to do then ?—He will be under training under me for managing the estate for some years and then he will be paid the full Rs. 50.

32599. You do not offer bright prospects for agricultural education. You only offer the man Rs. 50 a month after training ?—That is what I can afford; perhaps bigger landlords would be able to pay more.

32600. You say *roseum* is deteriorating. Does it deteriorate in yield or in quality ?—In lint percentage.

32601. Altogether the whole yield is not bad?—No.

32602. What is the yield per acre?—It depends on the season and the soil and manure. In good soils with good season and heavy manuring every variety would yield more than one *khandi*, 784 lbs., that is 28 maunds.

32603. What is your maund?—28 lbs: that is the weight by which it is called in Chandur, that is to say 28 lbs. to the maund and 28 maunds to the *khandi*. That would be the best outturn in one acre.

32604. Do you call this a good yield?—Yes.

32605. What is the proportion of the seed to lint?—Approximately one-third in the bazaar variety. My variety is superior. This year I got about 40 per cent.

32606. So that it has not deteriorated in the yield?—That is not *roseum*; I am not sowing *roseum* at all for the last 5 years; I have my own variety.

32607. What is your variety?—I have got a mixed variety.

32608. What is the name of your variety?—There is no name for it. It is a mixture of many varieties of cotton. Only the bolls have been selected for the last twenty or twenty-five years by the man who has brought it into existence.

32609. It is sold as a mixture?—Yes.

32610. *Sir Henry Lawrence*: Under what trade name?—There is no particular name; it is *sarki*, cotton seed of a particular kind.

32611. *Sir Ganga Ram*: You said in answer to my colleague's question that the Gambling Act should be applied to cultivators who play cards?—Not only to cultivators but to all Berar people; that means wherever this evil is in existence.

32612. Should not the Gambling Act be applied to bridge playing and to clubs?—No.

32613. Why not? The same argument applies?—Clubs may be exempted.

32614. Will your Legislative Council pass that sort of exemption?—I have not thought about it at all. I have laid the evil before you, and it should be checked in the best way possible.

32615. Do you not think that total prohibition will lead to illicit distillation?—I am conversant with the state of things in America, where total prohibition has created bootleggers.

32616. And they are now coming back to the former state of things?—They are not yet coming back, but there is a lot of trouble.

32617. Do you want to apply prohibition in the case of liquor only, or do you want it to be applied for *charas*, *ganja* and opium?—*Charas* and *ganja* are not liquor.

32618. You want to stop only liquor?—Yes.

32619. *Sir Henry Lawrence*: Not drugs?—I have not thought about it. Thi question has come as a side issue: I only said that there are 3 Sub-Inspectors of Excise in one taluk, and their number should be reduced.

32620. Do you think that will pay for the increased number of schools that you advocate?—Some reduction in the staff may be made.

32621. What should be the reduction?—One Sub-Inspector for a taluk would be sufficient, according to my view.

32622. Should not they put an extra income-tax on lawyers?—Why on lawyers alone?

32623. Supposing the money had to be found somehow, and such a proposal were put forward, would you agree to it?—I might agree. Supposing I am a philanthropist, I may agree to anything if this evil can be stopped by my self-sacrifice.

32624. Most of you lawyers are in the Legislative Council; will they pass it?—No, now they are not in the Legislative Council.

32625. What is a cultipacker?—It is an instrument by which the land can be consolidated after ploughing. It is of American manufacture, and can be had from Messrs. Macbeth Bros. & Co.

32626. In this Province how far apart are the *ganjes* where the cultivators can go and sell their cotton?—In the Chandur taluk there are 2 markets, 10 miles from each other. From the farthest end of the taluk, each is at a distance of 18 miles. The taluk is triangular, and the markets are in the centre.

32627. The cultivators have not to go more than 18 miles?—No.

32628. The evidence before us was that in some cases they have to go 100 miles?—That may be in other taluks. In Chandur they may have to go 20 miles, if we take the farthest end of the taluk. There are other markets nearby, such as Arvi and Amraoti, and some people go there.

32629. I understand that you are keeping poultry for the purpose of egg selling?—I keep them for catching cattle ticks.

32630. Is that the only object?—Yes, and because I had to keep some poultry for that I preferred to keep the best.

32631. Would you sell the chickens?—I may, if there are too many.

32632. But that would go against Brahminism?—As at present constituted it would not go against it.

32633. Have you thought of carrying poultry keeping one step further by going in for incubators?—I have not got incubators, but I have got one foster-mother; I have purchased it for Rs. 60.

32634. Do you find any difficulty in getting your men to handle poultry?—They do not keep the yards clean, so I have got a separate poultry house.

32635. Are there any religious objections?—Our women object. Of course the religious Brahmins may object.

32636. Do your servants object?—No.

32637. What class of servants do you employ?—*Kunbis* and others.

32638. There is no objection on their part?—No.

32639. *Prof. Gangulee:* Where do you sell your eggs?—Chandur is a taluk headquarter, and they are absorbed there.

32640. *Sir Ganga Ram:* Have you any objection to depressed class boys sitting in the same school with the other boys?—Not at all.

32641. Personally you may not object, but would your co-religionists object?—There may be some who would object, but I would not join them.

32642. Are your tenants mostly depressed classes?—Many of my servants are *Mahars*.

32643. What class do the tenants belong to?—I have no tenants; I cultivate the land myself.

32644. You have no ploughmen?—I have servants, of whom 5 are *Mahars* and 10 belong to other classes.

32645. *Sir Thomas Middleton:* How long is it since you took your degree?—I took my B. A. degree in 1905 and my L..B in 1907.

32646. How long have you been farming?—For 10 years, since 1916.

32647. You make a recommendation that junior officers of the Agricultural Department who have spent most of their services in wheat tracts should as far as possible not be transferred to cotton tracts and *vice versa*. What leads you to make that recommendation?—The Province is a big one, and when I thought over the question, I took into consideration the whole Province. I know that the question of wheat production is quite different from the question of cotton production. In a general way, I have arrived at that conclusion. I cannot give you any specific instances.

32648. It is based on a general principle?—Yes.

32649. On page 480, you say that the spread of education will lighten the burden of agricultural debt. In what way will that happen?—If they are educated they will be more economical; they will not spend as much as they do in gambling and marriage ceremonies, and they will not incur such heavy debts.

32650. On the next page, you make the suggestion that the land should be *bunded*, and not allowed to be fallow in the rainy season. What is behind that suggestion?—I think the question referred to the washing out of land, and how it can be prevented. If the land is level, the flow will be easy. If the land is *bunded*, the flow of course will be at a particular place, and fallow lands are more liable to be washed out; that is why I have made that suggestion.

32651. You are not thinking of the possibility of getting both *kharif* and *rabi* crops if you *bund* the land?—The moisture will be preserved. For wheat I plough the land in the rainy season, and so the question of moisture and *bunding* does not come in in our Province where crops are not possible owing to scanty rainfall. I have mentioned it for the sake of preventing the erosion of land.

32652. On page 484, you make a suggestion that I cannot see the object of. You say that Government should encourage shopkeepers to sell combinations of feeds. In your district you have got any quantity of cotton seed, you have got both your *chuni* and *sarki*. What is the necessity of subsidising shopkeepers to supply mixtures of these things?—What I meant was that these things should first be analysed Cotton seed may contain more than what is necessary for the nutrition of cattle. Therefore, I say that cotton seed *urid*, *mung*, etc., should be analysed; the mixtures necessary for milch cattle, for draught cattle, and for calves should be differentiated, and such feeds should be made available to the public, at least to such persons who would like to go in for them. It is not possible that a Marwari can know the sort of feed which is necessary for my purposes, and therefore shops should be started where they would be available. They may not actually be subsidised, but they should be encouraged, so that agriculturists can go there and purchase according to their requirements.

32653. It seems to me a very round about way of getting a balanced ration for the cattle. You are an intelligent person, you have taken a degree, and you should have no difficulty whatever in understanding an analysis?—I do not understand analysis at all. I do not know what proportion of *mung* and *urid* should be given to my cow.

32654. If you spent half a day in studying the subject, you would understand it perfectly?—I do not know where I could study it. I read in the *Times of India* only the other day in a review of the report of the Pusa Institute that grasses were analysed in Pusa as regards their nutritive value but I do not know whether *kadbi* and *mung* and other cattle foodstuffs grown in our Province were so analysed.

32655. Oil-seeds have been analysed hundreds of times; cotton seed, *mung* and *urid* have also been analysed?—But I want to know what proportion of them is suitable for milch cattle, what proportion for bullocks, and what proportion for calves.

32656. It strikes me that if a man of your intelligence went to the Agricultural Department and said that you wanted to know those things, you would be referred to some book which in a short time would enable you to make up your rations for cattle better than a Marwari could?—I have never suggested that the Marwari will not be able to give me the feed, but the proportions of feeds available in the various Provinces have to be given by experts in the sciences of chemistry and animal nutrition, with practical experience.

32657. *Sir Ganga Ram*: You want to know the nutritional values?—Yes, of all the foodstuffs before they are mixed and the proportions in which they are to be mixed. I have suggested that such shops, if they are at all feasible, should be encouraged. If officers know it, of course, I may be able to get from the officers of the department the information that I want in this respect, but all persons will not be able to approach officers to get that sort of knowledge.

32658. If you get the information and use the right mixtures, your neighbours will begin to copy you?—We are not so particular about such things here. All people will be able to get such feeds if there are shops where the right mixtures are made available. All cannot come to me for advice, and follow it.

32659. *Sir Henry Lawrence*: Would you not give them advice?—It is not possible to advise all, because I will be the only man in the whole taluk having the knowledge.

32660. *Sir Thomas Middleton*: You referred to the fact that cotton bolls have been selected for the last twenty to twenty-five years?—I did not do the selection but the men from whom I purchased seed did it.

32661. Is not that quite a common practice among the cultivators?—In Berar, I have found only these two instances who have done a lot of improvement. Of course, there may be other people doing it outside the taluk, but these two persons have improved the percentage appreciably by selecting.

It is an old practice among cultivators of some parts of India.

32662. *Sir Ganga Ram*: Are the agriculturists in this Province well served with regard to postal facilities?—Pretty well I should say; in the villages they get a *dâk* once a week.

32663. Are the post office savings banks readily available?—The banks are available, but no agriculturist puts his money in those banks.

32664. Do they hoard money in the form of gold?—They sometimes have some spare cash and the labourers invest in silver ornaments.

32665. In jewellery?—It cannot be called jewellery; it is silver.

32666. What is your opinion as to the question before the Legislative Assembly with regard to the 1*s.* 4*d.* or 1*s.* 6*d.* rupee, looking at it from the point of view of the interests of the agriculturists?—That is a very difficult question; I have not been able to digest all the matter which appears in the newspapers on that question, but from the way in which the matter is treated I should say 1*s.* 4*d.* would be the best, because there are so many people in favour of 1*s.* 4*d.*

32667. *Mr. Calvert*: In Berar, do Brahmins plough with their own hands?—Some may be doing so. I do not know of any particular instance.

32668. Generally do they regard it as being beneath their caste status to plough?—It should not be. Ploughing is a difficult operation but harrowing can be done by anybody; there is no caste difficulty, but usually the Brahmins cannot in fact plough.

32669. *Prof. Gangulee*: Are you interested in social service work?—Yes.

32670. On page 485 you say: "Institutions like the Social Service League of Bombay should be established through Government." What do you mean?—They should be encouraged by Government; that is all I mean; it should be a private concern, but the main incentive should come from Government officers, because it is quite a new thing.

32671. The incentive for social service must come from Government; is that it?—Of course, it may be done in some big places without Government aid, but in the villages it cannot be done without Government aid.

32672. What exactly is the idea? I do not understand?—There are many villages where the people are not educated at all; in such villages they have village societies such as co-operative societies; all these societies are of course incorporated by the help of the Government officers, so I suggest that those persons who incorporate that sort of society should be made to look to this work as well.

32673. One social service work is the abolition of untouchability; do you want the Government to do that?—No, that cannot be done by Government.

(The witness withdrew.)

Rai Sahib DADU DWARKANATH SINGH, Talukdar, Seoni.

Replies to the Questionnaire.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) In my opinion, causes which have influenced the cultivator in improving his practice are constant demonstrations by the staff of the Agricultural Department of improved implements, pure seed, holding of agricultural exhibitions, and propaganda by the department, but more than these, the example of their neighbours; once a new implement or seed is introduced in the village by an influential man and its advantages become manifest in better outturn, others take to it.

(*b*) and (*c*) At present demonstrations are carried out by the Agricultural Department at the district headquarters or at two or three places in the district. The paucity of demonstration plots is a serious drawback in the spread of the methods and seeds recommended by the Agricultural Department. That is the reason why the propaganda work which has to be carried out without practical method has not attained as much success as it would have been possible under other circumstances. In my opinion, the best form of demonstration should be to assure the agriculturist by suggesting and working the recommended improvement in a small plot in his own field. This will necessitate an ample provision of adequate and properly trained staff organised on lines dictated by experience.

QUESTION 5.—FINANCE.—(*a*) There has been some discussion as to how should long and short-term credit be supplied to cultivators. Since 1870 Government has tried several measures to finance the agricultural operations of the country by lending money to the cultivator on the security of land. But the measures have not solved the problem as yet. At present the Government advances loans under Act XIX of 1883, the Land Improvement Act, and the Agriculturists Loans Act, XII of 1884. Under the former Act money is advanced for the specific purpose of land improvement and under the latter for the purchase of seeds, bullocks, fodder, etc. The money advanced under these Acts is called *taccavi* loan and in normal times is necessarily small and is only for purposes specified in the Acts. A cultivator, however, requires money from time to time for other purposes and it is natural that, if he can borrow from the State only for those purposes, he should deal with the moneylender who supplies him with money at all times. Co-operative credit societies have therefore been opened among the cultivators to supply the need. But co-operative societies supply loans for short-term and on personal credit. This necessarily means that the present and existing indebtedness will remain as it is. In my view, however, the importance of co-operative credit societies for suppiying short-term capital cannot be gainsaid. They supply a badly felt want and give the cultivator credit where he has none. Agricultural operations are facilitated and profits made secure. Then the societies practically perform the same function as the agricultural banks and are very useful to agriculturists who have very small pieces of land to mortgage. I therefore advocate a great increase in the co-operative credit societies for supplying short-term capital. Their importance, if properly looked to, should not be lost sight of as elevators of the moral and material tone of the people. As regards long-term loans, it is very difficult for the co-operative credit societies to deal with them. From time to time the proposal of starting land banks has been mooted by several people of note. As far back as the year 1884, the Government of India tried to establish a land bank in the Bombay Presidency as an experimental measure, but it could not be given a trial as the Secretary of State thought the scheme to be an unsound and impracticable project. This question has time and again been discussed and it has been suggested that rural indebtedness cannot be solved by the co-operative societies alone, because it is said they are only palliatives and do not help in the removal of existing indebtedness. It is therefore recommended that land mortgage banks should be started in a particular area and loans should be advanced to the more solvent cultivators for repayment of their present debt on the security of lands, at comparatively easier rates and on equitable conditions. Against this, it is urged that land security is likely to become of doubtful value in view of the constant sub-division of land on account of the operation of the Hindu and Mahommedan laws of inheritance. Agricultural banks, though they cannot wipe out indebtedness, will no doubt remove a long-felt want for long-term loans. Some suggest that this to a certain extent can be met by granting *taccavi* loans for long-term and realising the debts in small instalments spreading over a number of years. But *taccavi* loans are

only granted for specified purposes. Revenue officers grant such loans in some cases but their operations are insignificant in comparison with the total demand. Hence I am inclined to think that land mortgage banks are the only means to solve this problem.

(*b*) *Taccavi* loans are given for land improvements, purchase of bullocks and seeds, and similar other agricultural purposes. The cultivators however do not make full use of the system as these loans do not suffice for the purpose for which they are taken and consequently difficulty is found in repaying the instalment. Then these loans are given only for the purposes specified above and as they have to borrow for other purposes also they prefer to have dealings with moneylenders also. Then again some say that there is a rigidity in collection and this is another cause which discourages people from taking these loans My present experience is that this is not the whole truth and in several cases considerable amounts have been remitted. I however propose the following steps which should be adopted to induce the people to make full use of the system:—

(1) Loans should be for longer terms than at present and instalments fixed should be smaller; care should be taken that loans are employed for productive purposes only, in the case of seed, pig proof wire fencing and bullocks, etc., agricultural associations or co-operative societies should be asked to supply the things needed and the money should be placed at their disposal. This is being done to a certain extent, but still much remains to be done.

(2) Collection should not be made from other members for the default of a certain member. This has been done at times and generally operates harshly upon the solvent members.

(3) In the case of money for improvements, the carrying out of the improvement should he insisted upon; for this, therefore, I think the amount should be advanced early to enable the tenants to make their improvements before the rains.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) (*1*) The most potent cause of borrowing is the extravagance indulged in on occasions of rejoicing and mourning. I have seen persons reduced to poverty after marriages in their family. Expenditure on marriages, on the rites for deceased relations and on annual ceremonies is rather lavish and reckless. These are expenditures which the customs of the country and false notions of social position in the community encourage. The farmer sees most of the villagers and his relatives in debt and he does not see any harm in following their example.

He wants to earn a name amongst his *biradries* and for the time being he does succeed by lavish expenditure.

(2) Another cause of indebtedness is to be found in the increased facilities for borrowing consequent on the enhancement of ryots' credit due to a rise in the value of the land and on the increase in the number of moneylenders. Talking of *malik-makbuza* plots, no restriction is imposed on the ryots as to the mortgage or transfer of this land by sale or gift. One great evil result of this is to give the ryots ready access to the moneylender, and this, coupled with the enhanced credit which a ryot has on account of the readily realisable high money value of agricultural crops consequent upon the extensions of communications and trade developments, light assessment and enforced and continued peace under the British rule, has made credit excessively wide. Easy credit tempts him to borrow on every conceivable occasion. The ordinary peasant is so improvident that he is ready to promise any rate of interest on a loan which will satisfy his immediate wants. In the Central Provinces, I find the *malik-makbuza* plot holders were for similar reasons heavily indebted while the absolute occupancy and occupancy tenants were in proportion much less indebted owing to restrictions imposed by law upon their transfer.

(3) Another cause of borrowing is the litigious habits of the people. However embarassed a man may be, he always seems to find money for a law suit. Most of the litigation is of such a trifling nature that it could be easily settled if referred to the village elders, but the horde of touts, agents and half educated petition writers who live on this never allow the matter to be settled amicably.

(4) Drought fluctuations in the season, death of plough bullocks due to some epidemic also lead the peasant to incur debt. In this connection, I may mention that diversity of occupation is the only remedy which can meet with contingencies and at the same time allow the ryots to save something in normal times.

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(5) In India, agriculture is in the hands of small holders who are unthrifty and without capital; credit is therefore an inevitable condition of such a state of affairs. The farmer needs seed for sowing; bullocks for ploughing and labour for working in the fields. Only a few of them have sufficient money to carry on these operations. They are consequently forced to borrow at times at a high rate of interest. But I have found from experience that the needs of cultivators for capital to carry on their operations are very small and these loans alone can never lead them to poverty. The major portion of their debts has been for unproductive purposes and to indulge in extravagance at the time of marriages or other ceremonial occasions. Even the *taccavi* loans which have ostensibly been taken for productive purpose have never been spent in full over these things.

(6) Increase in the price of all the factors of production and lower productivity are due to bad systems of cultivation.

(ii) As a rule, agriculture in India is in the hands of small cultivators who are improvident and without capital; credit is therefore essential for such a farmer.

(1) This being so, from time immemorial moneylending has become a business. And everywhere there has sprung up a class of moneylender. He is the principal source of credit of agriculturists. He is not altogether as blood thirsty a creature as he is painted. As Sir Frederick Nicholson says, "He fills an absolute gap and is a rural necessity; on the other hand, he is most undoubtedly an expensive and dangerous necessity. The ryot is always in need of money There is a marriage, a law-suit or seed is needed at the time of sowing, or, the farmer needs money to support himself during the time his crops have failed; on these and other occasions his chief resource is the village moneylender. The great drawback of the moneylender is that he charges a high rate of interest. He looks more to his pecuniary gains than to the interest of his clients and seldom fails to take advantage of their indigence. Moneylending being a time honoured business every village has got its own *sowcar* (moneylender) at times or a group of villages has its *sowcar* in some central village. Marwaris, *kalars* and *banias* are generally the moneylenders.

(2) The second source of agricultural credit is *taccavi*.

Government advances loans to cultivators for purchase of bullocks, seeds, improvement and fodder, etc., and these loans are commonly known as *taccavi* loans. The liberal manner in which Government comes to the rescue of hundreds of thousands of peasants specially in time of famine and scarcity is a matter of common knowledge and thankfulness.

These advances are also given at other times, but in ordinary season the grant of *taccavi* has to be restricted. The amount which a State can advance for such purposes at ordinary times is, after all, limited. The State has got its own fixed charges to meet every year and it is beyond the power of even the richest Government to relieve all the financial needs of the agriculturist. Credit is a necessity of agricultural life and can be supplied by the banks.

(3) The third source of agricultural credit is the co-operative credit societies. They are of recent origin and are very limited in number. They come to the help of those who are already somewhat thrifty. They are not open to the people who are sunk in debt and cannot afford to deposit anything in these banks. The number of societies in this district is only 146, as compared with the number of villages which is about 1,600. Thus every 11 villages have got only one society. Ample scope lies for the development of societies in this district and attempts are being made to extend the benefits of co-operation to a larger area of population.

(ii) Most of the reasons lie in the habits and custom of the people. Some of them are enumerated below.

(1) Social ceremonies which absorb so much of the cultivator's income not only force the cultivators to borrow money to celebrate them, but prevent them from repaying debts which they may have contracted in a bad season.

(2) An average farmer generally incurs a debt on every possible occasion with the result that when he dies he leaves a large debt to his heirs, which they inherit along with the property. The heirs for some time pay off the interest or a part of the principal, but one drought or deficient harvest compels them to defer payment with the result that the amount becomes so great that they find it very difficult to pay it off and eventually they grow despondent and allow it to reach a figure when they are forced to part with their land and become landless serfs.

(3) *Sowcars* and some malguzars are generally very slack in collecting debts from solvent clients and allow the sums to swell till a figure is reached when they get a tight hold on the debtor.

(4) Interest owing to its high rate absorbs much of the savings and repayment therefore becomes difficult.

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(*b*) That the agriculturists are largely in debt goes without contradiction. Any improvement in the existing state of cultivation would mean a change in the present methods of production, which postulates a certain amount of capital. But agriculturists are largely in debt, hence no question of supplying capital can be thought of which will completely remedy things, unless steps are taken to lighten the present burden of debt.

From time to time various measures have been suggested and attempted with varying degrees of success. *Taccavi* loans and organisation of co-operative credit societies on the line of people's banks in Central Europe have been devised and have been in operation for some time past. Co-operative credit societies which came to be regarded as the sovereign remedy cannot frankly solve the problem. They only supply short term and personal credit and they cannot cope with the real evil of existing and long standing indebtedness unless the load of debt is removed from the neck of the cultivators and they are enabled to carry on their operations freely and profitably. Besides co-operative societies help those who are already thrifty to a degree. Those who are heavily in debt are not admitted to membership and consequently have no help at all.

Special measures therefore become necessary for people who are rather heavily in debt. One proposal which has very often found favour with the non-officials is the establishment of Conciliation Boards to deal with rural indebtedness as was done in the Bhandara and Hoshangabad districts of the Central Provinces some twenty years back. Personally, I think such a proposal is not altogether unsound. It is rightly urged that in the Conciliation Board the Marwari will probably scent a scheme to undermine his position and considerable resentment is likely to be evoked from that quarter. Particularly in the Central Provinces where the malguzar is often the money-lender, this scheme will prove successful and it is to the economic advantage of the malguzar to have a prosperous and contented tenantry. In my opinion, in selected areas this should be given a trial. It is said that big banks do not help the agriculturists, the village *sowcar* deals with them and he charges a high rate of interest. A volume of public opinion therefore favours application of the Usurious Loans Act with a view to stop this high rate of interest being levied. And the question of affording relief to debtors in unconscionable bargains between debtors and moneylenders has been the subject of discussion for several years. Therefore the Government of India brought a bill before the old Imperial Legislative Council (now defunct) in September 1917 and it was passed and became law in 1918. The principle of the Act is to give the court authority to go behind a contract, to re-open the transaction, and to reduce the interest to an equitable amount, I think strict enforcement of such a law will surely have an ameliorative effect upon the condition of the debtor. The lender is in a position to take unfair advantage of the borrower; it is therefore necessary to protect the latter. The trade of moneylending is not likely to be much affected as the needs of the ryots are many and the lender will get many victims. I do not think any useful purpose will be served by facilitating redemption of mortgages.

(*c*) There is no doubt that a considerable amount of borrowing is due to the extension of credit consequent upon the rise in value of land. Under such circumstances, the unrestricted right of cultivators to transfer their holdings is an accentuating cause of indebtedness. In my opinion, for the Central Provinces *malik-makbuza* plots, some restriction is needed for the transfer of the land on the lines of the Punjab Land Alienation Act or the Bundelkhand Land Alienation Act. These, to a certain extent, will check the speed with which the landed class is being ruined and stop the land passing in the hands of moneylenders. But merely to curtail the peasants' capacity to borrow is not enough and may perhaps do more harm than good. Under the Punjab Land Alienation Act, land cannot be alienated by the landed class to non-agriculturists, with the result that a moneylending class has grown up amongst the agriculturists themselves and it is reported that they lend money at high rates of interest as they have no competition from outsiders. But I think the rate of interest can be much reduced by the introduction of co-operative societies and by the strict enforcement of the Usurious Loans Act. Even suppose the land will pass into the hands of agriculturist moneylenders, I think people who lose by this are mostly those cultivators who are not living in comfort from the income of their land. They will go elsewhere to find occupation in industries, etc. But I think advantages to a certain and limited extent are likely to accrue from these measures.

So far as I am aware no terminable mortgages are not common in this tract and I do not therefore think any legislation is called for to prohibit them. But wherever they are in practice, prohibition will doubtless do good to the cultivator.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) The excessive sub-division and fragmentation of holdings that is going on in the country has rightly attracted the

notice of public men and Government alike. From time to time men of note have suggested several measures to remedy this state of affairs, but unfortunately no tangible results have been attained so far. There are no two opinions that this sub-division is detrimental to the agricultural interests of the country. The question is how to reduce the inefficiency in agricultural operations attendant upon such a state of affairs. In my opinion, the real remedy lies only in using up-to-date and scientific methods on consolidated and enlarged holdings. But as it is, even productivity on small holdings can be increased to a considerable extent by education and co-operation of the small cultivators in intensive culture. Small and scattered plots are not peculiar to India alone. It is reported that such a state of affairs prevailed in France, Belgium, Denmark and Japan, but in these countries the outturn of crops has much increased. In the latter country it is said that the average holding is a little over 2 acres but there the peasants are reported to work in their fields from sunrise to sunset, giving practically each plant a liquid dose of manure and having consequently more outturn per acre than the Indian peasant. Then the Japanese peasant, over and above this, combines sericulture with farming, which is a great side industry and gives him a good supplementary income. The Belgian farmer though he has also a small holding is more fortunate as he puts the land under very intensive cultivation and grows only those crops which will amply repay his labour and capital. Science and co-operation have shown to the small holder there how to extract more produce from his holding by employing proper amount of capital in it. In India, therefore, following the examples of other countries, it is desirable that intensive culture should replace the extensive culture now in practice. This can be done by individuals, but I think the co-operative movement can do it more easily. Farmers will therefore have to be organised in co-operative societies for production and disposal of their products. This will take a considerable time but it will lead to great improvement in the existing state of things. I think enquiries will also be necessary from time to time to find out what crops can be grown with the utmost profit, consistent with the religious sentiments of the people. Thus if the system of cultivation is changed, the cost of production is decreased and the use of improved implements and pure seed is resorted to and the income is increased by having better outturns, lastly, by eliminating the profits of the intermediaries by means of co-operation, the net profits from these holdings are likely to be considerably increased.

(*b*) I have already noted above that the real remedy for the present agricultural ills which will bring about regeneration in the national economy of the country lies in the use of the up-to-date methods of agriculture on consolidated and large holdings. The method of increasing productivity by the intensive culture of small holdings is likely to be slow, and even then the result obtained from it will be only limited in extent. Consolidation of holdings is, therefore a problem of the utmost magnitude. The chief obstacles to such consolidation of holdings after it has been sub-divided into many parts are—

(1) According to the Hindu law of inheritance, every male member of the family is entitled to a share in the family property from the time of his birth and can demand partition at any time and there is the universal custom that the sons inherit equal shares. The result is that people have got a strong attachment to their ancestral holdings and are not willing to part with it.

(2) Increase in population also makes it difficult to allow the holdings to become compact. The villagers generally depend upon agriculture for their subsistence. They do not therefore part with their land. They want to keep the land for themselves whether it brings them profit or not.

(3) The laws of land tenure allow the lands to be sub-divided and sold in satisfaction of debt.

(4) Fatalistic acceptance by the cultivator of his present limited means of subsistence and low standard of living.

Having considered the above obstacles, I now pass on to discuss ways of overcoming them. Disintegrating forces set in motion cannot easily be checked unless the people are assured of immense profits from the arrangement leading to consolidation of holdings In Bombay, Mr. Keatinge proposed a Bill to be enacted permitting the holding to be consolidated and preventing its further sub-division, but unfortunately the Bill did not become a law. In the United Provinces, also Professor Jevons proposed a scheme to effect a solution but it did not achieve any practical result. Recently, in the Punjab, a successful attempt has been made to solve this problem through the agency of co-operative societies. In every village, a society is organised under the influential and disinterested guidance of a Government officer specially detailed for this purpose; certain bye-laws are made for such a society. Each landowner is persuaded to agree to the desirability of consolidation and to agree to the repartition of land proposed by two-thirds of the members and to refer the disputed matter to a panchayat

In the Central Provinces, certain tenancy rights are likely to increase the difficulties. Then the villagers, especially in this district, want different kinds of lands as insurance against crop failure to keep themselves busy all the year round. So the scheme is not likely to be successful.

(c) The principle guiding the members should be to avoid compulsion as much as possible, but once the majority has agreed it would seem expedient that legal powers should be taken to compel the minorities to agree and to deal with minors' widows, etc. Without this power, the scheme will lead to litigation. Further a law should be made which will legally empower the arbitrators to make an award under Government supervision final, and thus keep disputes out of court.

QUESTION 11—CROPS.—(a) (iii) The present method of distribution of seeds is not satisfactory. An average cultivator is generally in debt and as soon as the crops are ready he sells a part of them to pay a part of the debt; the rest he uses for home consumption and other incidental expenses. The result is that he has nothing left at the time of sowing and he is forced to borrow seed from the malguzar or some grain lender at *sawai* (1¼ times) or *derhi* (1½ times) according to his status and dealings with the lenders. These lenders generally lend inferior seed to the cultivator and as he has none he has to content himself with whatever he gets. Co-operative Seed Unions should, therefore, be opened in large numbers to supply pure and good seed to the cultivator at a reasonable rate of interest.

(iv) It is a common knowledge that, among the wild animals, pig is a great nuisance to the agriculturists. The extent of the damage done by them to the crops is considerable. Various measures have been tried without any appreciable result. In my opinion, the real remedy lies not only in destroying them, but also in preventing them from entering the fields. The Agricultural Department has been trying to popularise pig-proof wire fencing, but owing to its cost it has not made sufficient progress. But I think in the long run it is quite cheap and should be popularised. For destruction, shooting clubs have not proved very successful for want of active interest by the members. Lincenses for crop protection have been issued on a very liberal scale, yet the number of pigs killed has remained insignificant. Therefore the real remedy for destruction lies with cultivators themselves. Unless the indifference so far evinced by the cultivator is displaced by active propaganda to lessen the nocturnal visitations of these mischievous and troublesome pests, no progress is possible.

QUESTION 17—AGRICULTURAL INDUSTRIES.—(a) The average holding in Berar as ascertained by me, varied from 15 to 35 acres according to the pressure of population and quality of land. In the Central Provinces also it is somewhere between 15 and 30 acres. The number of days which an average cultivator holding, say, 20 acres spends on his *rabi* (wheat, etc.,) crops is some where near 240 days as shown below.—

Month.			*Work.*
June	...	28	... (1) Ploughing of the field, 15 days. (2) Fencing of *beras* with horns, 10 days. (3) Taking grain to the market, 3 days.
July	...	20	... (1) Ploughing, 15 days. (2) Sowing of *kharif* crops (*juar*, etc.), 5 days.
August and September	...	30	... (1) Occasional ploughing, when there is no rain, 10 days. (2) Weeding, etc., 10 days. (3) Collection of grass 10, days.
October	...	25	... (1) Preparation of the field for *rabi* sowing, 15 days. (2) Harvesting of *kharif* crops' 5 days. (3) Collectoin of grass, 5 days.
November	...	25	... (1) Sowing of *rabi* crop, 15 days. (2) Threshing of *kharif* crop, 5 days. (3) Collection of grass, 5 days.
December, January and February		40	... (1) Collection of grass, 15 days. (2) Bringing of fuel, 15 days. (3) Miscellaneous, 10 days.
March, April and May	...	72	... (1) Harvesting, 15 days. (2) Threshing, winnowing and carrying of crops, 42 days. (3) Miscellaneous, 15 days.
Total	...	240	

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During other days the cultivators spend their time in comparative idleness. If there are marriage or other ceremonies at the house of their relatives they will attend them. During the winter they also spend a part of their time in repairing their houses. For the rest of their time they either smoke away the day or frequent markets or go on pilgrimages. They cannot leave their homes to go elsewhere to find occupation as these days are spread at intervals over the whole year. It is therefore, necessary that there should be subsidiary industries at home, to occupy their spare time.

(*b*) Subsidiary industries such as cattle-breeding, dairy farming, sale and planting of fuel wood, conservancy and sale of manure, should be encouraged by organising people to work on co-operative lines. For the families embroidery and hand works can be encouraged by providing a market for them at a good price.

Poultry rearing.—The greatest factor militating against its spread is the religious sentiment of Hindus who will not do this even if they starve. Mahommedans and Christians are likely to take to it provided they are assured of a good market for their products.

Fruit growing.—It is really a paying concern, but it requires certain amount of capital to be invested in sinking wells and making other improvements for rearing fruits. Even if the necessary amount of capital and skill were forthcoming, the difficulty of marketing the produce is great. Vegetable produce and fruits do not fetch a good price in the villages and as the means of communications are not sufficiently good, the question of taking the produce to towns becomes a costly proposition and the returns obtained are not commensurate with the extra expenditure and trouble involved. The third reason is that certain people do not like to grow vegetables and fruits as they think it beneath their dignity to do so and the work is therefore generally done by the *Kachi* castes.

Lac culture.—For some time past there was a belief that it was inhuman to propagate and collect lac and naturally the higher class people did not take to it and left the trade in the hands of castes called *Patwa* and *Pichra*. But with education this belief has died out and people, even the *banias*, in many places are eager to do this and if it is collected in sufficient amount, shellac can be prepared locally.

Rope making and basket making.—These two industries are not likely to be received with favour by the people. A higher caste Hindu has an idea of false pride in not taking up things which people of low caste have been following. Thus, the caste system and the custom of centuries make him consider all sorts of manual labour and industries other than his own beneath his dignity.

(*d*) The chief factors necessary for the success of the kind of industries catalogued in this class are—

(1) Necessary capital.

(2) Trained men to act as managers or supervisors.

(3) Satisfactory marketing of the produce will necessitate greater and cheaper facilities for transport than exist at present. The products produced must be cheaper than similar articles imported from foreign countries.

(4) Labour.

(5) Expert guidance.

I think most of the industries can be easily established if proper guidance is given; labour is quite sufficient in the villages and can be usefully employed on these works. There are several people who will be willing to invest capital also if they are assured of sufficient profit. The question is whether the State should aid such industries and whether any beneficial and permanent results would be obtained by such aid. I think State aid will be of no use unless the people themselves work hard and bring the above factors together in proper proportion. I am not very hopeful of any tangible results from State aid; if it is to be given it should take the following form, and should not be such as to stimulate industries artificially—

(1) Improved implements should be made available at a reasonable price by reducing railway freight on them.

(2) Loans can be given to *bona fide* societies formed for carrying on such industries on an equitable rate of interest.

(3) Products may be protected for some time.

(4) Guidance and advice should be given by the staff of the Industries Department suggesting the ways leading to the success of the industries.

(*e*) Industrial concerns should not be allowed to move to rural areas as they will change the rural economy and make agricultural living very costly.

(*f*) It is necessary to have an intensive study of every village industry with a view to find out possible means of improvement in its working and cost.

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(*g*) Villagers may be made to realise that insanitary conditions bring in their train disease which they at present attribute to God. For this, societies should spring up in every village and the members thereof should try to persuade the villagers to keep their surroundings neat and clean.

QUESTION 20.—MARKETING.—(*a*) and (*b*) I am dealing here mainly with the wheat produce in the Central Provinces where market facilities are very defective. I have not much comment to make on the Berar cotton markets as, there, the buyers and sellers are brought together and the latter are able to sell their produce to whom they like at a competitive price. But in practice the cultivator suffers much owing to certain malpractices, *e.g.*, taking of cotton in the shape of samples from the seller and manipulation of the balances in favour of purchasers by the weighmen. These and other similar abuses do not permit the cultivator to secure full value for his produce. In Akola, under the guidance of certain influential people, an *adat* shop has been opened. It works on the principle of co-operation and helps the members thereof to sell their produce through the society. There is room for considerable improvement in this direction at other centres also. New cotton market rules are also expected to give greater relief to the cultivator.

Coming back to the Central Provinces for *rabi* crops, the system of marketing is as below. Every farmer or tiller of the soil, even in small holdings, has a surplus of some kind that is to be turned into cash. He cannot supply all his requirements from the produce of his land. He has, at times, to dispose of separate articles and has to find many buyers. He is therefore a loser. Much improvement can be affected by the introduction of co-operative societies for collecting small surpluses into one and selling them at a good rate. Now, coming to the bigger farmer, if he is in debt a part of the produce is generally taken possession of, by the money-lender who generally pays a lower price. Suppose that a man is not in debt, then in that case a grain dealer (merchant) or his servant comes and settles, with the individual farmer, a rate which is generally below the rate prevailing in the grain market town, which is generally at some railway place. But the seller's cart is generally hired and he is paid a rupee or so as *hire* and thus to some extent he makes up the loss in rate and gets an opportunity to make purchases for which he would have, in any case, been required to go to the market. These dealers pay a part of the price and pay the balance after disposing of the produce. On reaching the market place, the produce is taken to the *adat* shop, where the *adtiya* purchases the produce for himself or for some Bombay firm and charges commission from the seller of the produce and also from the Bombay firm. The *adtiya* pays for the produce purchased by him in the evening of the day on which the transaction has been affected. A part of the produce is also brought by the cultivator himself to the market in his cart and he has also to pay commission and other illegal charges, *e.g.*, *dharmada*, *goshala* funds, cleaning of the yard and watering charges etc. Considerable trouble is thus experienced by the seller on account of these levies and consequently he is unable to secure the full price for his produce. My idea is that in this way the intermediaries take about 5 to 10 per cent of the produce. *Adat* shops worked on co-operative lines are therefore recommended and the levies made in the market should be made illegal. A grain market committee consisting of buyers and sellers should be instituted at each market place to look into the question of weighing and stopping the levy of illegal dues.

(*c*) Steps should be taken to classify the goods brought into the market according to their quality and purity. Talking of cotton, there should be rates distinguishing between short and long staple varieties. The present system is defective. It gives rates according to market prices and this leads to great adulteration. Similarly, for wheat and other produce, distinguishing rates are necessary.

(*d*) It would be to the distinct advantage of the cultivator if he had correct information about the market conditions and rates. These rates and other news can be published in the market places.

QUESTION 22—CO-OPERATION.—(*a*) (i) As an alternative to the opening of land banks aided by the State, the Government has initiated and encouraged a system of co-operative credit among cultivators on the lines of the People's Banks in Central Europe, by opening societies for the purpose in various villages and by arranging for the inspection and audit of their accounts by an official staff. So far the State has not taken any financial responsibilities in the matter. After the initial stage, as the movement progressed, Government began to relax its control, leaving more and more responsible work in the hands of non-officials. The result was that the societies went on multiplying without sufficient and efficient provision for supervision and inspection and uninspired by the true co-operative spirit. The movement was therefore for

some time threatened with disaster and the Government has now been exercising more control. This accounts for the fact that the movement has not, even up to now, touched the fringe of the problem of rural credit and indebtedness. There is no doubt that it is more useful to have slow and steady progress rather than allow unco-operative and weak societies to come into existence. But I am inclined to think that the speed at which the movement is going is rather slow and cautious and there is much more scope for extending the operation of the movement. I think, for rapid progress, Government officers of influence in sufficient numbers are necessary to enable them to know the local conditions thoroughly. Such an organised class of workers should precede rather than follow the society. An enthusiastic co-operator of note has truly said "To attempt to pass on to honorary organisers the development of rural credit is nonsense and fraught with danger". Even at this stage, the supervision of the Central Bank staff has not proved satisfactory, while the Government agency has always proved success owing to the prestige which an officer has, superior education, efficiency, independence and disinterestedness. Steps, therefore, needed at this stage are—

(1) A staff of a quality and strength which would ensure rapid progress.
(2) Increase in the power of the Government Auditor, as regards the fixing of the credit limit of the societies.
(3) Stopping the Central Bank from supervising the work of societies.
(4) Increasing the usefulness of the institutes recently opened for propaganda work, by deputing more officers for this work.

(*a*) (ii) Up to now, with notable exceptions, non-officials have not taken as keen and active a part as the movement deserves. In some cases only passive acquiescence was seen; what is required is active work. Unfortunately, in many cases, busy bodies have come forward to work as office-bearers only to boss over the show. In the circumstances, non-official agency can help thus—

(1) By enlisting themselves as volunteers for infusing among members the desire to help and improve themselves by combined effort.

(2) To carry out the work of spreading the organisation initiated by the Government.

(3) Discouraging unproductive expenditure.

(4) To check the tendency to run the banks or societies as profit-seeking concerns.

(*b*) (i) The chief form of co-operation in the Central Provinces is the co-operative credit society. Its aim is to supply credit at a cheap rate and also to teach the cultivators the value of thrift and self-help. In the Central Provinces, the chief source of capital of primary societies is loans from the Central Bank. Therefore the total borrowing power of a society is fixed by the Central Bank. This has not worked well, as in most cases it has not been properly fixed. I think the Government Auditor is the best person, and check limit and credit limit should not be very different from each other. Loans should be used for productive purposes; this has not been done in the past owing to want of proper supervision from the Bank staff.

(ii) This is rather an advanced form of co-operation and has not taken firm root in this Province. But if started and properly worked it has a great future as much of the profit of the middleman will be saved and the consumer will be a gainer from it.

(iii) Such societies have not yet sprung up. There is one such society at Akola for the sale of cotton. The necessity for the formation of societies for sale has been discussed by me under Question 20—Marketing—(*a*) and (*b*).

(v) There are no such societies and they are badly needed in this Province. I have discussed about them under Question 7—Fragmentation of Holdings (*b*).

(vi) One such society, though not co-operative, exists at Murtizapur. The advantages to be derived from such societies are many as the cultivator can, without much investment, have the use of the best machinery and increase the produce of his land.

(viii) It is common knowledge that the breeding of cattle in the villages is on very unscientific lines and in consequence agricultural live stock has degenerated. Societies should, therefore, be formed on the following lines:—

(1) Cultivators may be induced to have good cows.

(2) Persons having such cows may be formed into societies and their cows should be covered by the society bull.

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(3) These cows and their progeny should be kept separate and not allowed to mix with the village herd.

(ix) Under this head I propose that societies should be formed for better living. Their aim should be to increase the standard of living of the members by general education, improved sanitation and housing, etc. This will lead to thrift and other useful results. Societies should be given power to fine their members in case of default.

(*c*) I think legislation will be expedient to compel the minority (say one-tenth) to join in any scheme named in this class for the common benefit.

(*d*) Many of the societies I have personal knowledge of are credit societies and they have not in the main attained the object in view, *viz.*, the principle of self-help and thrift.

QUESTION 24—ATTRACTING CAPITAL.—(*a*) In India, the educated class generally goes to urban areas in search of a profession and has a distaste for agriculture. The reason for this exodus lies in the fact of agriculture being looked upon as undignified. Unless agriculture is exalted there is no room for the best brains to take it up. Besides the drift of literate people to the towns, other people having money take very slowly to agriculture, because the returns obtained from agriculture with the existing methods are generally much lower than are obtained from trade and moneylending. This class of people even if they purchase land rarely work as farmers, which intensifies the evil it is sought to remedy. The present tendency to sub-division of holdings also discourages men of capital and enterprise from taking to agriculture, as men of enterprise and capital will naturally like to work their farms scientifically with improved implements and pure seed if they are to reap the full benefits from the soil. In the circumstances the following steps are essential :—

(1) There should be more education in the elements of agriculture among the agriculturist classes. The education given should be of such a type as not to create a distaste for agriculture in the mind of a boy. The boys should be made to feel that, as a profession, agriculture has unlimited scope for improvement and is likely to yield great returns to human efforts if scientifically and properly applied.

(2) Attempts should be made to stimulate thinking on rural problems by the study of different phases of village life, and for this facilities should be provided.

(3) The tendency to sub-division of holdings should be stopped. Steps to enlarge and aggregate holdings which permit the employment of scientific and-up-to date methods of agriculture will go a long way to attract men of enterprise to the land.

(*b*) I believe the landowner is anxious to improve his position and to adopt any means within his reach whereby his position can be improved. But ambition is soon crushed out of him because of the local and social conditions over which he has no control. Then there are family obligations; these make it impossible for him to improve his land. Thus my impression is that land improvements do not take place mainly for want of capital. Those who have got capital want to engage in moneylending which on the average brings about 9 per cent return to their capital, while the improvement of land appears to give him uncertain and fluctuating returns. There are some who content themselves by subletting their holdings and live upon their rents. Another belief which is current among a certain class of people is that improvements are taxed by the Government in the shape of enhanced assessment at the time of settlement. This argument has no force as improvements are already exempted from assessment and only illustrates the tendency of the people to blame the Government for anything and everything.

QUESTION 25—WELFARE OF RURAL POPULATION.—(*a*) In my opinion, much depends upon the health of the cultivators and this problem has not been properly attended to. Cholera and malarial fever and other diseases prevail at certain periods of the year and cause considerable loss to the people. They also lessen the efficiency of the worker. These are doubtless fostered, if not caused, by want of cleanliness on the part of the people. Much has been done to combat these but a vast field lies untilled in this direction. With the people, who, in spite of their daily numerous ablutions, are ignorant of the laws of hygiene, success means more time and patient work among them. I think an increase in the number of sanitation panchayats, village panchayats, travelling dispensaries and the spread of general education will remove some of the evils resulting from the present state of things.

(*b*) With the advent of the Reforms and other world wide causes, a new wave of industrialisation has entered India. The institution of machinery, which in the time to come may lead to the industrial regeneration of India, is making headway.

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Some people think that industries will alone make the country prosperous, but in my opinion this will not be so and the land should be restored to its proper position as the chief source of new wealth in the country and almost the only source of producing raw material for the industries. When over 70 per cent of the people in India gain their livelihood directly from the soil, the prosperity of this country seems destined to rely more upon agriculture than upon industries. Hence the improvement of the agriculturist's livelihood constitutes the readiest way of improving the material progress of the country. The question of regenerating the economic life of a cultivator is therefore a problem of the first magnitude. Under these circumstances, a close study of some of the phases of rural economic life is essential. It is impossible to acquire a keen and permanent interest in the problem unless one is cognisant of its nature and significance. This accounts for the fact that the social and economic interests of the Indian farmers have not as a rule received proper consideration at the hands of Indian politicians. As, to know the disease accurately is half the cure, so it is very necessary to find out what ails the cultivator, hence the necessity of an agency for carrying out the proposed survey.

Having considered the necessity of an enquiry it is necessary to find out what agency and method are requisite to carry out the object in view. In my opinion, Government agency is the only reliable and proper agency to carry out this work. If definite lines of enquiry are laid down, the existing district staff with a little extra trouble will be able to conduct the survey. The pitfalls in the way of the enquirer are many and figures collected become of doubtful value unless they are constantly checked by observation. The Government officers besides knowing the area under enquiry have the advantage of supplementing facts by constant observation and comparing the same with facts collected in a simi ar way under similar conditions.

SCOPE OF PROPOSED ENQUIRY.—In selected villages the enquiry should be of a searching character with a view to elicit correct information as to the size of holding of each ryot, the extent to which he is indebted, the amount spent by him on food and clothing, on social ceremonies which absorb so much of the income of the cultivator, etc. Estimates of the cost of production with the amount of produce received and the possibilities of decreasing the cost of production and increasing the outturns from his fields also should be studied.

METHOD.—In my opinion, one tahsil should be the unit of enquiry. A single village can hardly typify the conditions of a Province. It is, therefore, necessary that the study should be spread over a number of villages in different tracts. The results obtained by such study are likely to be of broader application. This will also enable us to invest gate the conditions under which agriculture suffers from deteriorating influences. It will then be possible to locate the cause and finally to devise means to remedy it. This enquiry should spread over a long time.

Oral Evidence.

32674. *The Chairman*: Rai Sahib Dwarkanath Singh, you are a talukdar in the district of Seoni in the Central Provinces?—Yes.

32675. We have your note of evidence; would you like to make any statement in amplification of that note?—I have already written what I have to say.

32676. And, if I may say so, you have made your views very plain. What is your own connection with agriculture?—I am an agriculturist; I have got 96 villages in Seoni district.

32677. How many acres?—Each village is 1,000 to 2,000 acres.

32678. You do not know the exact area?—No.

32679. Is that held by you on the malguzar right?—Yes.

32680. Have you got any cultivation in your own hands?—Yes, over 50 villages.

32681. You are cultivating them yourself?—Yes.

32682. By hired labour?—Yes, I have engaged servants.

32683. Do you pay the wages of your labourers in cash or in kind?—Sometimes they are paid in kind and sometimes in money too.

32684. Have you any irrigated land?—Yes, some; generally there is a little tank of my own in the home-farm; from the tank we generally irrigate the *kharif* paddy crop.

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32685. Have you any wells?—Sinking wells is not popular in my district.

32686. The irrigation is entirely tank irrigation?—Yes; when we have fruit gardens we irrigate with a well.

32687. What is your principal crop?—Wheat and rice.

32688. In regard to horticulture, are you growing oranges?—No, mangoes and guavas.

32689. Do you grow any vegetables?—I grow them for home consumption.

32690. Have you anything to tell the Commission as to the feeding of your working bullocks? Do you follow the usual practice?—Yes, we have got some forest and we collect grass; and there is local fodder, namely, wheat *bhusa*.

32691. Do you grow any fodder?—We have big fields of fodder and we cut it annually; it is collected for our own bullocks.

32692. What sort of fodder?—Just grass.

32693. Have you tried any of these new grasses that have been imported?—No.

32694. Do you make any silage?—No.

32695. What manure do you use?—Cowdung.

32696. For the wheat land?—No, we do not give manure to the wheat land there is not enough for use in the paddy land.

32697. Do you use artificial fertilisers in your wheat land?—I have not tried them.

32698. For how many years in succession do you grow wheat on the same piece of land?—We grow wheat and gram alternately, generally.

32699. Do you think there is much manurial substance in the water that comes out of the tanks? It has been suggested by one witness that his land maintained its fertility owing to the fact that the water with which he irrigated his land swept through the village areas and picked up a considerable amount of plant food in so doing?—How can that be so? The silt deposits in the tank. The fields near the *basti* are more fertile than any others, but I do not know that the tank water will help in that way.

32700. I suppose you have to clean your tanks out from time to time?—Yes, we dig up the silt from the tank beds and spread it in the *bandhies*.

32701. Would you give us an indication of the outturn of your land?—Wheat usually gives 4 to 5 times, and rice 10 to 20 times.

32702. How long have you known the land?—Four or five years.

32703. Have you the history of the cropping of the land for any length of time? Do you know what went on before you went there?—Yes, I used to go there with my parents.

32704. It is a family estate, is it?—Yes, for two hundred years we have been settled there.

32705. Has there been any diminution of the fertility of the soil?—It is going down.

32706. You think the fertility of the land is decreasing?—Yes.

32707. What proof have you in support of that statement?—Generally the fields are washed away when there is no particular arrangement for *bunds*, and if the management is a little careless.

32708. That is soil erosion?—Yes.

32709. But what about the fertility of the soil that is in position?—We like to take crops off the land, but generally we do not give manure.

32710. *Prof. Gangulee:* Is the yield from the land decreasing?—That depends on the season; this year we did not get any rain and the crops naturally decreased.

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32711. *The Chairman*: Are you confident in your own mind that this rather modest form of farming is the most paying; do you not think higher farming, as we would call it, that is farming on a system according to which you would put more money into your land in the shape of manure, might pay you?—Yes, if we put a *bund* round it pays; if we invest more money it pays.

32712. Do you not think you might invest some money in artificial fertilisers if you cannot obtain cowdung?—The expense would be too great.

32713. Have you ever worked it out?—I have not worked it out, but I do not think it would pay, because we have to borrow money. I am speaking of the ordinary cultivator.

32714. I am thinking of your own case. I am trying to discover how it has come about that you have not experimented in the use of fertilisers for wheat growing?—We have not tried them.

32715. It is not for me to make suggestions as to how you should manage your farm, but do you not think you might venture an experiment over 10 acres. It would not involve much risk?—That we are doing with the help of the Agricultural Department.

32716. Why do you want the help of the Agricultural Department? You have only to buy a bag of artificial manure and put it on the land?—We have tried growing hemp on the land; the Agricultural Department advised us to do that; but that was not satisfactory.

32717. Do you mean green manuring?—Yes.

32718. On page 498, you speak of *taccavi* loans, and I judge from a later statement in your note that on the whole you are satisfied that *taccavi* loans are well administered?—Yes, but it is difficult to collect the loans.

32719. Have you come across a case where an application for *taccavi* loan was made and was refused, when you yourself from knowledge of the case thought the application was a reasonable one?—No reasonable application has been rejected so far, but where cultivators have bad habits, are not really solvent and do not utilise the money properly, and the Tahsildar knows they are not good men, it is refused.

32720. You do not think applications for *taccavi* loans are refused without good grounds?—No.

32721. You suggest the starting of land mortgage banks. Is not it the case that a great many cultivators in this Province have got nothing to mortgage?—Yes, and that is why they do not get any money from outside. Those who have absolute occupancy can mortgage, but ordinary occupancy tenants cannot mortgage.

32722. What proportion of your own villagers are holding on simple occupancy right?—All of them.

32723. So that none of your tenants can borrow?—No.

32724. Do you lend money yourself?—No, I do not do moneylending, but when the rent gets into arrears they have to enter into an agreement to pay instalments.

32725. Do you provide any seed?—Yes.

32726 How do you finance that?—On credit.

32727. What return do you get?—One-quarter of the crop.

32728. On page 498, you point out that the moneylender is not altogether as blood thirsty a creature as he is painted. Do you see any hope of eliminating the moneylender from the agricultural system of India for some years to come?—I think there must be someone, either the private moneylender, or the bank, or the *mahajan* or whoever it may be.

32729. You say: "The great drawback of the moneylender is that he charges high rate of interest"?—Yes; that depends on the solvency of the man.

32730. Do you mean that he insures against possible insolvency by charging a higher rate of interest?—The moneylender tries to get as much as he can in the shape of interest.

32731. It depends on the solvency of the borrower?—Yes.

32732. The man with a poor credit has to pay a higher rate of interest?—Yes.

32733. *Prof. Gangulee:* What is the private rate of interest in your neighbourhood?—It is about 24 per cent.

32734. *The Chairman:* On page 499 what exactly would be the function of the Conciliation Board, the setting up of which you suggest?—They can give some facilities.

32735. Would you give the Boards statutory powers?—I think we must; otherwise they cannot work.

32736. Would one of their functions be to cancel interest?—Yes.

32737. Do you think there is a danger that operations of that sort may limit the credit of the cultivators?—It will naturally follow; but at the same time their statue will be better; they will be given a good start.

32738. It is a question of degree?—Yes.

32739. You must be careful not to overdo it?—Yes.

32740. You are definitely of opinion, I see, that the putting into operation of the Usurious Loans Act would be advantageous?—Yes.

32741. You point out on page 499 that "a considerable amount of borrowing is due to the extension of credit consequent upon the rise in value of land". That looks as though the amount which the cultivator borrows is the amount which anybody is prepared to lend him?—Yes.

32742. It is rather measured by his credit than by his needs; he borrows as much as he can get?—Yes.

32743. Does that suggest to you that there might be some danger in affording unlimited cheap credit?—Yes, he may misuse it.

32744. Then you give us an interesting note of your ideas in the matter of consolidation of fragmented holdings. Have you experience of this in your own villages?—We have not got this scheme there. But I was talking about this in the Provincial Board of Agriculture with regard to Chhattisgarh.

32745. Would you turn to your answer to our Question 20 on page 503 of your note? I see that you think that the amount of cotton taken as a sample amounts to some deprivation to the cultivator 'owing to certain malpractices, *e.g.*, taking of cotton in the shape of sample'. Do you think that enough cotton is taken for this practice to be a serious disadvantage to the cultivator?—They take as much as they like and so many people take it.

32746. You mean they take large handfuls?—Yes.

32747. It is the actual amount taken that you complain of; is that right?—Yes.

32748. Are you familiar with the society at Akola?—No.

32749. Do you sell your cotton through the ordinary market?—I do not deal in cotton; I deal in wheat and rice.

32750. Taking rice, do you go to the ordinary market or sell to the merchant?—I go to the market.

32751. Wheat?—I sell to the *banias*.

32752. Straight to the *banias*?—Yes.

32753. On page 503 half way down you say: "the produce is taken at the *adat* shop, where the *adtya* purchases the produce for himself". Now the *adtya* is really a small broker or commission agent, is he not?—Yes.

32754. Is it not highly improper that one who acts as a commission agent should also buy as a merchant?—There were some rules to prevent this.

32755. What effect had these rules?—There were Cotton Committees last year; I do not know exactly what happened.

32756. When I ask you to sell my cotton on commission I assume that you are going to get me the highest prices in order that you may get the biggest commission; but if you are going in fact to buy as a merchant you are trying to get my cotton as cheap as possible?—Yes.

32757. Then I understand from your answer on page 503 that there is no sufficient grading of cotton and that as a result value is not obtained for quality; is that so? You say, 'Steps should be taken to classify the goods brought in the market according to their quality and purity'?—We cannot do it because any amount of stuff comes in and is mixed up together.

35758. Can you get the full value of your quality if you have got all your goods mixed up?—If it is pure we get a good price.

32759. You are talking about rural welfare at the end of your note, page 506. You say, 'It is impossible to acquire a keen and permanent interest in the problem unless one is cognisant of its nature and significance. This accounts for the fact that social and economic interest of the Indian farmers have not as a rule received proper consideration at the hands of Indian politicians'. All farmers in all countries will tell you that no politicians are of any good to them. But apart from that, what I wanted to ask you was this. Do you feel that more might be done to attempt to interest and inform what is called the intelligentsia in the business and life of the countryside?—There is a great scope for that.

32760. Have you ever considered the possibility of instituting a degree of rural economics, which degree might be a qualification for public offices in services other than those connected with the Agricultural Department?—I think there should be some such thing.

32761. Meanwhile the town-bred Indian, however able or active he may be, is as a rule very ignorant of the life of the country side, is he?—Yes. Even the people who say they represent the rural interests in the Council do not know anything about the rural conditions; but simply on account of their influence they enter the Council and I do not know what they do in the Council for the improvement of the rural areas.

32762. *Prof. Ganguleé*: Are you in touch with the co-operative movement in any way?—Yes; I am a Director of a Co-operative Bank.

32763. Do you know of any primary society working in your neighbourhood?—Yes.

32764. Can you tell us how that particular society that you know of is working?—It is working well; it pays the instalments in time.

32765. Has that particular society attained the object that you mention on page 505, namely, the principle of self-help and thrift?—It has not attained it to the full extent, but it is on its way to attainment.

32766. You visit these societies occasionally yourself?—Yes.

32767. On page 500, you make a reference to certain crops that can be grown with the utmost profit consistent with the religious sentiments of the people? What are the crops that you have in mind?—*Sann* hemp and *lakhori*, a kind of pulse.

32768. Do the people still have prejudice against these crops?—No, when it brings in money all the prejudice is gone. *Sann* hemp was supposed to be grown only by the low caste people and now Brahmins are growing it.

32769. Do you think that religious sentiment is certainly not a handicap?—It is disappearing. A certain well-known Rao Bahadur, who is a Brahmin actually got a prize for *sann* hemp in the last exhibition and that shows that the prejudice is disappearing.

32770. With regard to the consolidation of holdings, could you tell us what is the attitude of the malguzars towards this question of consolidation?—Generally you *will* find that the malguzars have got the best land and the poor cultivators are given lands far away from the best lands. If the malguzar has lands to give out, he will always keep the best portion of it for himself and give the remainder to the cultivator.

32771. But he is not in favour of consolidation, is he?—It all depends on his mood. I am a malguzar and I am in favour of consolidation.

32772. But your brother malguzars are not?—That depends on their education and the objects they have in view.

32773. Have you at any time discussed this question with your brother malguzars?—Not seriously, but casually.

32774. You say that the present method of the distribution of seed is not satisfactory. Why?—When they get a sort of *taccavi* from the Government they go directly and purchase anything they want.

32775. From where do you get your seed?—I have got my own farm and I also get seed from the Government farm.

32776. You are a member of the Board of Agriculture?—Yes.

32777. Have you at any time made a suggestion before the Board as to how to improve the method of distributing seed?—The demonstration farm takes the responsibility of distributing seed to the different people in central areas some 20 miles apart, and the seed is distributed from there.

32778. I want to know if you yourself at any time ever took part in the discussion?—No.

32779. Was there any discussion at any time to improve the seed supply?—I think there was.

32780. Were you present at that discussion?—Yes.

32781. Did you yourself take part in it?—Yes.

32782. With regard to agricultural industries you told us that 240 days is the average number of days during which the farmers work and you talked about subsidiary industries. What are the subsidiary industries that you would like to introduce if you had the power to do so? Have you thought of any spare-time occupation?—No, I have no definite programme for that.

32783. You grow cotton?—No.

32784. You farm a very extensive area. Would you appoint an agricultural graduate from the Agricultural College here to manage your farm?—Yes.

32785. Have you at any time tried to get one?—All the graduates that come out are employed by the department itself.

32786. If you got one how much would you pay for him?—I could afford to pay about Rs. 100 a month, just to look after the farm work and nothing else.

32787. Did you approach the agricultural authorities here to supply you with a man when one was available?—I had a talk with Dr. Clouston on the subject and he said that he was short of men himself.

32788. What variety of wheat do you grow?—*Pissi*. In my neighbourhood they grow Pusa 4.

32789. Who introduced it?—The farm gave it to us.

32790. *Mr. Calvert*: Have you read a book by Mr. Darling called 'The Punjab Peasant in Prosperity and Debt'?—No.

32791. There is a great similarity of views between your note and Mr. Darling's book. Is land passing into the hands of moneylenders to any great extent in this Province?—It is gradually going away and the *banias* and pleaders are now monopolising it.

32792. Do you think that the process will do any harm to the country?—The real cultivators of the soil will disappear; they will drift to the cities for jobs and if they cannot get jobs they will have to come back and take to farming again.

32793. You are inclined to recommend land mortgage banks. Would they be on the co-operative method or some other method?—I think there ought to be some other method.

32794. Have you thought it out?—No. We want some sort of organisation which would interest the malguzars. There is no provision for big landlords.

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32795. You say that the needs of the cultivator for capital to carry on his operations are very small. Could you give us an idea of the amount of cash required for one acre of wheat?—I think generally a cultivator is in possession of 10 or 12 or 13 acres.

32796. How much cash is required for one acre of wheat?—If his bullock dies at the very moment he would require Rs. 30 or Rs. 40 to purchase a new bullock.

32797. You have not worked it out per acre?—No.

32798. *Sir Henry Lawrence:* Have you got any forest area in your villages?—Yes.

32799. Do cattle graze on them?—Yes, the people of the neighbouring villages bring their cattle to graze there and they are charged grazing fees.

32800. At what rates?—At the Government rate. We charge the same rate as the Government charge.

32801. Is that the ordinary custom with the malguzars? Do they charge the Government rates?—They charge more sometimes. People who belong to the village are charged less; those who want to graze their cattle for a short period are charged more.

32802. Is there any surplus of cattle in your villages? Are they more than is necessary for the needs of the cultivators?—There are not enough for the needs of the cultivators.

32803. We were told that in a great part of this Province far too many cattle are kept. Is that not your experience?—There are not too many cattle. As a matter of fact I am required to purchase bullocks for my own home farming.

32804. Useless cattle are not kept at all?—Sometimes the old cattle are kept on as the people do not like to part with them or destroy them.

32805. Have you tried to improve the class of cattle in your villages?—Yes.

32806. What is the breed of bull you have?—The Gaolo breed, which is a local breed. It is not a good milking breed; it is a good trotting breed.

32807. And for plough work?—I get them from Hoshangabad for plough purposes especially in wheat areas. For the mud Goalo bulls do very well.

32808. Do you not keep any cattle for milk purposes?—Up to now we have kept buffaloes only because we let the calves drink the milk.

32809. Do you know that experiments have been made in some parts of India to show that you can improve the milking capacity of cows?—Yes, by crossing with Montgomery bulls.

32810. You have studied that?—Yes.

32811. But you have not adopted it?—This year we have sent for a bull from the Seoni District Council. They purchased a Montgomery bull and it is being used.

32812. You personally as a landowner have done nothing in that respect?—No; we are just trying the Gaolo and Malvi bull.

32813. Do you think it would be reasonable to raise the grazing fees in Government forests?—I think they are quite high enough. If we increase them we have to diminish the grazing in particular tracts. Supposing we have grass land for the grazing of 2,000 cattle and we allow 3,000 cattle that will not be sufficient. If these facilties were provided I do not think there would be any objection to increasing the grazing dues.

32814. In some areas the malguzars charge four times the Government rate?—Yes, that all depends on the needs of the man who wants to have his cattle grazed.

32815. And that rate, namely, four times the Government rate, is paid by the people?—It depends on their necessity. Supposing there are grazing areas near their houses, they will naturally pay more for those because they can supervise their bulls more easily.

32816. And that raises no discontent on the part of the payer towards the malguzar?—I think he agrees to pay and that is why he takes his cattle there for grazing.

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32817. And he is perfectly content with the bargain ?—He has got to be contented.

32818. *Sir Ganga Ram:* What is the average area of your villages ? Will it be 1,000 acres to each village, roughly ?—I have not gone into the details of it.

32819. Could you not make a rough guess ?—I cannot tell you exactly.

32820. You said there are 56 villages ?—Yes.

32821. How much land revenue do you pay ?—Rs. 35,000.

32822. Do you know the rate of revenue per acre ?—No, I have just taken over charge of the family business.

32823. Are you manager ?—I am just one of the members of the family.

32824. Is your estate subject to the Hindu law of inheritance ?—Yes.

32825. It is capable of being divided from one generation to another ?—Yes.

32826. How many shareholders are there now ?—We are a joint family.

32827. But you have not been a joint family for three generations ?—We have been a joint family.

32828. You divide the income ?—We have a common mess, and we are a joint family.

32829. All of you ?—Yes.

32830. How many shareholders are there ?—There are 4. Formerly my grandfather was the only man in possession of the estate. After him, out of his 5 sons 4 died and only 1 son survived. We get hold of one man in our family and make him the head.

32831. Supposing any of the present shareholders want to have their portions separated, what will happen ?—He will certainly have his choice.

32832. Supposing this division goes on, in another 50 years each sharer will have only 10 to 15 acres ?—Yes.

32833. And after that there will be sub-division into still smaller fragments ?—Yes, that will go on and the deterioration will continue.

32834. Have you ever thought how it could be stopped at certain limits ?—It is not in our hands. If my son demands his share, I cannot stop him from having it.

32835. Is your property situated in one block ?—It is in 30 villages, in patches.

32836. Is it high land ?—Some of it is high land and some low land.

32837. Is there any hill land ?—We have some hill land and some of it is in the plains.

32838. Can you give us a rough idea of the population of your estate ?—No, I have not calculated it.

32839. You said that this year the rains have failed and you are afraid of losing your crops ?—Yes.

32840. You say you have a tank ?—It is not for wheat, it is for paddy.

32841. But this is not the time for paddy ?—No.

32842. How is it you are afraid of losing your wheat ?—The land is not irrigated.

32843. Can you not irrigate it from the tank ?—No.

32844. Can you not lift the water for that area ?—The water level is very low.

32845. Does the tank hold any water. It is just enough to irrigate the rice tract.

32846. Rice is finished now ?—Yes, and the water has gone down.

32847. There is water in the tank ?—Yes, but it is not enough to irrigate the wheat tract. Even pumping up the water will not help.

32848. You are a Rajput ?—I am a Kayasth.

32849. You have always been a native of this Province ?—We have been in the Province for 200 years.

32850. *Sir Henry Lawrence:* What Province do you come from ?—From the United Provinces, Rai Bareilly.

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32851. *Sir Ganga Ram*: You pay Rs. 35,000 as land revenue; what is your profit?—Just half.

32852. For the whole year?—Yes.

32853. You manage it yourself?—I have my agents and sub-agents.

32854. There must be a general manager?—Yes; one of my relations is the manager.

32855. You do not grow cotton?—No.

32856. Why not?—Because it does not grow in my tract.

32857. How do you know that it does not grow?—We have tried to grow it, but the soil is not suited for cotton.

32858. Have you any of your own schools there?—We have District Council schools in some villages.

32859. You have not offered any facilities to your tenants in the shape of hostels or anything like that?—No, but sometimes I get hold of my tenants' sons and send them to schools at Hoshangabad.

32860. Did you receive any agricultural education?—No.

32861. Are you a graduate?—No, I am a matriculate.

32862. You are not a member of the Legislative Council?—No.

32863. *Sir Thomas Middleton*: On page 501 of your evidence, you have given us a detailed estimate of the time that a cultivator spends in cultivating his *rabi* crop. You make it 240 days?—Yes, approximately.

32864. Have you got these particulars from your books, do the figures represent your own experience?—It is what I see every day.

32865. You just sat down and made an estimate?—Yes. For a 20-acre plot, ploughing will take 15 days, and the rest of the operations must be finished within the time I have indicated.

32866. You say that the *kharif* crop grown on this area is rice?—Yes.

32867. Do you have anything else?—There is *juar*, but it is very little, because when the weeding operations are started, transplantation operations go on side by side and generally the people go for transplanation rather than for weeding.

32868. When you were making this estimate, what size of holding had you in your mind? Something like 20 acres or more?—No, because that depends on the working capacity of the man. If a man works in a certain area, he will have his programme, and he must finish within a certain time, according to the size of the holding.

32869. Supposing a man has less than 15 acres, he will not be fully employed?—He cannot be fully employed.

32870. Are there many in your villages who have less than 15 acres?—Yes Afte the ploughing, they hire themselves out as labourers.

32871. They themselves go out as labourers?—Yes.

32872. What is the usual size of the holding of your villagers?—Sometimes they hold 60 to 80 acres; sometimes they are malguzars and they reside in the villages.

32873. You do not have many men who are holding less than 15 acres, and who are going out as labourers?—There are many holding 10 acres. But they cultivate an additional area on the *adhia* system. Some of them have got bullocks of their own, and in fair weather they go out to the forests and use them for bringing teak. In the cultivating season, they cultivate some additional land on the *adhia* or half and half system.

32874. Is wheat the only important *rabi* crop in your district?—Yes.

32875. What is the time of the year when you have most difficulty with fodder?—June and July.

32876. Just before the rain brings fresh grass?—Yes.

32877. I see that you estimate that the average cultivator would spend about 35 days in collecting grass for his bullocks?—Yes.

32878. How many bullocks do you suppose him to have?—Two bullocks.

32879. Does he keep any cows at all?—He may have one cow.

32880. Or a buffalo?—A buffalo is not generally kept. If a buffalo dies there will be greater loss to the man. They prefer to keep a cow.

32881. Would the man who has 60 to 70 acres keep a buffalo?—He will have two buffaloes.

32882. You told us that there are 4 members in your family; when you were preparing this evidence, did you discuss it with the other members of your family, or is it your own?—I consulted them, and I consulted some of my friends. There is division of labour in my family; one looks to the social side, another to agriculture, and so on.

32883. This evidence represents a consultation in your family?—Yes.

32884. On page 503, you think that, as compared with Berar, your people in the north are not so well off for markets?—Yes, because where there is cotton there is a market, but for wheat we have to deal direct with Bombay.

32885. Have you been much in the Berar markets?—No.

32886. You are not aware of the fact that from Berar markets there are many complaints?—No, I have not gone there.

32887. So that your belief that they are better off than you is not founded on personal knowledge?—No, I know nothing about Berar markets.

32888. *Sir Ganga Ram* : You have just listened to the evidence of one witness about prohibition of liquor. What is your view about it? I know personally that liquor is a favourite drink with Kayasths?—Not with all Kayasths.

32889. Would you favour the idea of prohibition?—Liquor drinking is bad and I think any sensible man will be opposed to it.

32890. Will your community object?—My community does not take liquor.

32891. I am not talking about you personally, but of the community as a whole?—There are 12 sub-divisions among the Kayasths.

32892. But your community as a whole takes liquor?—We shall be outcasted if we take liquor.

32893. If liquor were prohibited, you think your community or anybody else would not be put to any inconvenience?—When my community does not take liquor, how can they be inconvenienced?

32894. Would they not take to illicit distillation?—When they do not drink, why should they go in for it?

32895. *Sir Thomas Middleton*: Are there any members of your family who are graduates?—No. I am the only one who has passed the Matriculation examination.

(The witness withdrew.)

The Commission then adjourned till 11 a.m. on Saturday, the 29th January, 1927, at Hoshangabad.

R. S. DADU DWARKANATH SINGH.

Saturday, January 29th, 1927.

HOSHANGABAD.

PRESENT:

The MARQUESS OF LINLITHGOW, D. L. (*Chairman*).

SIR HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
PROFESSOR N. GANGULEE.
Dr. L. K. HYDER.
Mr. J. A. MADAN, I.C.S.
Mr. F. W. H SMITH.
(*Joint Secretaries*).

Mr. KALURAM POCHORY, representing the Agricultural Association, Gadarwara.

Replies to the Questionnaire.

QUESTION 2—AGRICULTURAL EDUCATION (i).—No; neither the trained teachers nor the institutions are in sufficient number in the Province to impart a sound knowledge of agriculture to the students in general.

(ii) There is great need for agricultural education in this district. There is not even a primary school in Narsinghpur where pupils can be taught the broad principles of modern agriculture.

(iii) Yes, most necessarily. Gradually a large number of such trained teachers will be available.

(v) Only a few study agriculture for the sake of agriculture and improve the methods of cultivation on their holdings. Most lads learn agriculture for the sake of getting into Government service.

(viii) Nature study, school plots and school farms are all essential and beneficial. These create in the students a liking to receive higher training in agriculture. 3 to 5 acres of land should be attached to each school in rural areas, and an expert teacher should be provided to impart the training.

QUESTION 3—DEMONSTRATION AND PROPAGANDA.—(*a*) Intelligent cultivators should be helped with improved implements; these should be demonstrated on their farms from time to time when necessity arises.

(*b*) & (*c*) Improved implements might be demonstrated in different localities to which they are best suited by a sufficient number of skilful demonstrators from time to time. Every facility should be given to such demonstrators to make the demonstration a success. If there were a number of trained demonstrators in a district, and if the most suited and useful implements are demonstrated by them, the demonstration should prove a success everywhere. These demonstrators should receive special training in the use of machinery from time to time in the course of their service at the leading institution to become familiar with the ever changing designs and improvements introduced in modern machinery.

QUESTION 5.—FINANCE—(*a*). For improvement of land and purchase of improved machinery, money should be advanced by the Government for long terms at a low rate of interest (*i.e.*, at not more than 3 per cent).

(*b*) The low rate of interest of *taccavi* loans by the Government will induce the cultivators to make much use of the *taccavi*, but it should be seen that the cultivators make the right use of such loans, and to ensure this either the improved implements or the improved seeds should be given instead of cash or the malguzars concerned should be informed of the *kisans* taking such loans so that they may keep an eye on the proper utilisation of the money.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The poverty of cultivators, increased standard of living (when everything has gone dear), high rental and poor outturns of crops.

(ii) The cultivators take the loans either from the Government or from the local *sowcars* or malguzars to whom they mortgage their property (land).

(iii) Poor outturns, accidental deaths of the working bullocks or marriage of sons or daughters.

(*b*) The *sowcars* or moneylenders should be bound in the Province by legislation to give loans to the cultivators at not more than the settled rate of interest.

(*c*) Absolute-occupancy land should not be mortgaged. All the rules and regulations applicable to occupancy land should apply to absolute-occupancy land also, and the law should be amended accordingly.

QUESTION 8.—IRRIGATION.—(*a*) (i) There are no perennial canal facilities in the Narsinghpur district; they should be created there.

(iii) The Government should help largely by advancing the loans at a low rate of interest to the cultivators for construction of wells for irrigation purposes. The Agricultural Engineer or his staff should advise them at what depths they would get economically water on their holdings, and supply them the most economical pumping plants direct from the large firms dealing in such plants thus avoiding the intermediaries and procuring the plants at a moderate cost.

QUESTION 10.—FERTILISERS.—(*a*) Improvement by the use of fertilisers would be possible if the Agricultural Department in this Province purchased these direct from the manufacturers, and were able to dispose of the same at cost price. It would be better if some of the fertilisers were manufactured in India by the aid of the Government.

(*f*) If the Government forests are opened free to the agriculturists for taking out wood for agricultural purposes and fuel, this practice of using cowdung for fuel would soon vanish.

QUESTION 14.—IMPLEMENTS.—(*b*) Most of the improved implements have been found useful for agricultural work, but they are beyond the reach of an average cultivator on account of their high cost. It is therefore suggested that the Government should import such implements direct from the manufactories and sell them to the agriculturists at a cost price. The fact should be notified to the agriculturists who will apply for their purchase. It would be much better if the Government started a workshop for the manufacture of useful implements in India.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) The Agricultural Department should maintain a breeding farm in every district, and supply bulls to the desiring cultivators on the premium system.

QUESTION 18.—AGRICULTURAL LABOUR.—(*b*) The agriculturists are now feeling the pinch of scarcity of labour. The main causes are that the labourers are recruited by the railway companies and various mills on high wages. Either agricultural labour should be bound by legislation and some percentage should be fixed to each village so that labour may be available for agricultural work, or the most efficient and best suited labour saving machines should be demonstrated on a large scale in villages to economise labour.

QUESTION 19.—FORESTS.—(*a*) The Government should bring down the heavy grazing fee for a buffalo to the level of the fee for a cow or bullock when it is taken to the forests. There are many hilly malguzari villages adjoining the Government forests. It so happens that some cattle of these villages sometimes go astray and step into the limits of the Government forests. The penalty which a *kisan* or a malguzar has to pay to the Government is very very high. It should be reduced and the cultivators should be treated more kindly by the forest authorities.

QUESTION 20.—MARKETING.—(*a*) Existing market facilities are not satisfactory. Gadarwara and Kareli markets of the Narsinghpur district are referred to in this answer.

(i) Communication from interior to the central markets should be facilitated by good roads and temporary bridges across the broad perennial rivers in open weather.

(iv) *Dharmada*.—A society founded in times past now exacts three pies on the sale of every 4 maunds of grain by a cultivator for giving alms to the poor. Other charity funds, and useless payments like the *hamali* charges, grain cleaning charges, charged

of a man who puts grain into the weighing pans while weighing, charges of a person who brings *adtya's* letters from the post office should all be checked. These charges are in addition to those which a cultivator has to pay to an *adtya* on whose shop he generally sells his grain, to the *dalal* (broker) who allures the cultivator to take his grain to a particular *adtya* for disposal and to the weighman.

(iii) In the cultivating season, the *adtyas* make payment in notes for the grain sold off to the cultivators and when the cultivators ask for silver, they take a discount which varies from three to eight annas per hundred as the case may be. This should be checked. If need be, main or sub-treasuries in a district should help by way of changing notes from the *adtyas* for silver coins.

(iv) There should be one sort of measurement throughout the district. The units of measurement differ very widely throughout the district and it is very difficult to make exact calculations.

(*d*) A Commercial Gazette, which may be published bi-weekly or daily in Hindi, is very badly needed, which may deal with market conditions, Indian or foreign, crop returns, Indian produce, etc.

Oral Evidence.

32896. *The Chairman*: Mr. Kaluram Pochory, you have been good enough to provide the Commission with a note of the evidence which you wish to give. Would you like to add anything at this stage to what you have written or may I ask you one or two questions?—You can ask questions.

32897. Would you tell the Commission what is your own connection with agriculture?—I am an agriculturist; I own a village and I have got about 200 acres of home-farm.

32898. What class of land is it that you own?—Malguzari.

32899. Is any of your land irrigated?—Yes, about 20 acres.

32900. By well?—By well and river.

32901. You have got one well?—Yes.

32902. How do you lift water from this well?—By *moles* made of leather and by means of bullocks.

32903. What are your principal crops on the 200 acres?—Wheat, gram, *juar tur*, etc.

32904. Are you growing any sugarcane?—I have started growing it this year.

32905. On the irrigated patch?—Yes.

32906. What varieties of wheat are you growing?—*Pissi* and A. 115.

32907. And what cane?—Mauritius.

32908. So that the Agricultural Department has been of some service to you in providing good varieties?—Yes, certainly.

32909. How many villages do you own?—One.

32910. Is that malguzari?—Yes.

32911. How many acres?—The area of the village is about 4,000 acres.

32912. Do you take an active interest in the cultivation of your tenants?—Yes, certainly. For instance, formerly I was not doing any cultivation and I have taken it up now with the idea of improving the holdings of the cultivators.

32913. Are you encouraging the villagers to sow the improved varieties?—Yes. Cotton was unknown formerly in my parts; now many cultivators have taken up cotton, ground-nut and sugarcane.

32914. Do you lend seed to the villagers?—Yes.

32915. How do you finance that advance?—I charge interest at 25 per cent.

32916. You take interest in kind?—Yes.

32917. Do you lend any money at all to the villagers?—Yes, I do.

32918. Have you any co-operative credit society in the village?—No.

32919. Have you had any experience of a co-operative credit society?—No.

32920. At what rate of interest do you advance money as a rule?—At 12 to 24 per cent per annum.

32921. Do you find that your villagers are able to make punctual repayments?—Not always.

32922. Depending, I suppose, on the season?—Yes.

32923. From your answer to Question 5 on page 516, I understand that you see some danger in the free granting of *taccavi* loans unless care is taken to see that the money is spent in proper directions?—Yes, certainly.

32924. In your experience, is an application by a cultivator for a *taccavi* loan usually granted if the request is reasonable one?—Yes.

32925. You think that the officers concerned are quite ready to grant *taccavi* loan where the applicant can show good reason for such a loan?—Yes; I was myself a Tahsildar and have got sufficient experience of these things.

32926. You suggest, in answer to Question 6 (*b*), "*Sowcars* or moneylenders should be bound in the Province by legislation to give loans to the cultivators at not more than the settled rate of interest". What is the settled rate of interest?—Not more than 9 per cent.

32927. That would bring your own rate of interest down by 3 points, would it not?—I do not mind that; I want that my cultivators should be benefited.

32928. Have you studied the history of attempting, at various times, at various places, to limit the rates of interest by statute?—No.

32929. Do you see any danger in that?—I do not know much about it.

32930. You put forward a suggestion that a certain area should be irrigated. Do you found that proposal on any expert advice?—There is a river in the Narsinghpur district and there was a proposal to dig a canal from that river; there is some correspondence about it in the district office.

32931. For how many months in the year is there water in the river?—Throughout the year.

32932. Do you know whether the levels have been studied at all? Is it possible to run the water from the river?—I do not know much about that; but I know there was a proposal.

32933. How many pairs of bullocks do you keep?—8 pairs.

32934. Have you had any difficulty in feeding these bullocks in seasons of fodder shortage?—Yes, great difficulty.

32935. What experiments have you made for the preservation of fodder?—I sow some fodder crops on my land; but I do not find sufficient fodder for my cattle.

32936. Have you heard at all of the making of silage?—Yes; I have heard of it.

32937. Have you ever seen it done?—Yes.

32938. Where?—I do it myself.

32939. You make silage?—Yes; but I cannot get sufficient fodder.

32940. Did you make silage last year?—No; I am doing it this year.

32941. For the first time?—Yes.

32942. *Prof. Gangulee*: Who suggested this to you?—I read about it in some books and in the leaflets which I received from Poona. I am now digging pits and putting my fodder in them.

32943. *The Chairman*: Then you make the suggestion that the male buffalo and the she-buffalo should be charged the same grazing rates as the cow or bullock?—Yes; they have got different forest dues.

32944. Do you know why the forest dues are higher for buffaloes than they are for the cows?—The Forest Department takes about 4 to 8 annas for bullocks and cows while it takes Rs. 2 for buffaloes.

32945. You do not think the buffalo eats a good deal more than the cow?—Yes, I think it does.

32946. You want the buffalo to be fed at the same price as the cow?—In the interests of the agriculturists we ought to reduce the rates.

32947. Have you any buffaloes yourself?—No.

32948. Do you get any milk from your own cows?—Yes.

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32949. What do you feed your milch cows on?—Grass.

32950. In the season of shortage what do you give them?—*Bhusa* and grass.

32951. Any grain?—Yes, also grain.

32952. How much?—One seer per day per head.

32953. For how many months in the year do you give it?—Throughout the year.

32954. Do you make any difference in the case of cows giving milk?—Not much.

32955. What is the best yield in milk from your cows?—2 seers per cow.

32956. Then you complain of the penalty that the *kisan* or the malguzar has to pay to the Government in cases of an mals going astray. What has the cultivator to pay?—Sometimes a fine of Rs. 10 to Rs. 50.

32957. For a first offence?—The man is produced before the court and he is fined.

32958. Tell us, in your experience, what happens the first time when the man's bullock is found in the forest?—He is fined Rs. 10.

32959. For one single bullock?—For the whole lot, for the offence.

32960. *Mr. Calvert* Is it compensation or fine?—It is a sort of fine.

32961. Is it not compounded?—The man is produced before the court and he is fined by the court.

32962. I think it is compounded; it is a voluntary payment in order to avoid prosecution?—He is made to pay it.

32963. But he pays it in order to avoid prosecution in the court?—He is prosecuted and produced before the court and then he is fined.

32964. *The Chairman*: Is there a shortage of labour in your district?—Yes; we are feeling the scarcity of labour.

32965. Do you cultivate your own 200 acres by hired labour?—Yes.

32966. Are you short of labour?—Certainly.

32967. You suggest, as a possible remedy, that agricultural labour should be bound by legislation. Do you mean that labour should be tied to the village?—Yes; sometimes in a village all the labour is taken away by the railway companies and factories. If there is legislation like this, a certain number of labourers will always be in the village and they will not leave the village.

32968. You suggest that the villager should be bound to the village; is not that old-fashioned?—My idea is that they should be made to work in the village on reasonable wages; otherwise people in the village suffer very much on account of shortage of labour.

32969. *Sir Henry Lawrence:* What is a reasonable wage?—4 annas.

32970. What is an unreasonable wage?—2 or 3 annas.

32971. You think the labourer can maintain his family on 4 annas?—If he remains in the village, his wife and children also do some work and earn wages.

32972. *The Chairman*: What wages are the labourers now offered?—When they get 8 annas a day they leave the village. For instance, those who are working on the railways are getting Rs. 16 a month and we pay them Rs. 8 in the village.

32973. *Hamali* means the charge for porterage?—Yes.

32974. *Sir Henry Lawrence*: Have you got any forest land of your own?—No.

32975. Have any malguzars got any forest land in your village?—No, my village is far away from the forest.

32976. There is no forest growth at all, or grazing land let out by malguzars?—No.

32977. And you consider the charges by Government for grazing in forests too high?—Yes.

32978. Should all grazing be free?—Not for all cattle. What I meant to say was that the agricultural cattle should be allowed to graze in the Government forest free because there is very little pasture land in our villages and the result is friction between the malguzar and the tenants, because the tenants take their cattle to graze in the malguzar's land in the night.

32979. The malguzars have got grazing land, have they?—Not all; some have, but the cultivators have not got any, and the result is that they take their cattle to graze in the land of the man who has reserved grass for grazing purposes and there is friction.

32980. Does the malguzar allow the villagers to graze their cattle on his land on payment of any fee?—There are not sufficient lands, and what he has is not sufficient for his own purposes.

32981. What fee does he charge for cattle grazing?—It is not the practice to charge any fee.

32982. You want the forest to be also free for bringing wood for agricultural purposes and for fuel?—Yes, I wish the people to preserve all their cowdung for manure. Manure is a most essential and necessary thing for the improvement of land and unless the people get their wood they cannot do it: they use cowdung fuel.

32983. Are the agriculturists allowed to take wood from the forests on payment now?—Yes.

32984. What are the rates of payment?—They pay 4 to 8 annas per cart-load.

32985. And for a head-load?—2 to 4 pice.

32986. And 4 annas for a cart-load? Is that too high?—It is not too high: it is high in this sense that the people take about 4 or 5 days to bring the wood and if they are allowed free wood then it would be a sort of a boon to them.

32987. You do not think it would damage the forests?—No; I think that according to the number of members in a family a certain number of cart-loads of wood should be allowed free. For instance, if a man has 4 persons he may be given two cart-loads of wood free for fuel purposes. In that manner he may be induced to preserve his cowdung.

32988. Is cowdung used at all for manure now?—Sometimes.

32989. What breed of cattle do you keep?—The *deshi* or local breed.

32990. Any Malvi?—No.

32991. Or Gaolo?—No: the breed we keep as I said just now is called *deshi*, that is a local breed.

32992. Do you make use of any bulls kept by the department?—Not at present. I am getting one this year.

32993. Are there no bulls kept in this part of the country by the Department of Agriculture?—No; not in the Narsinghpur district.

32994. *Sir Ganga Ram:* I understand you have got 4,000 acres of land altogether?—My village contains 4,000 acres of land.

32995. Out of that you cultivate only 200 acres? What about the rest?—It is cultivated by the tenants.

32996. You are the malguzar of the 4,000 acres?—Yes.

32997. How much do you pay in revenue?—Rs. 3,800 for 4,000 acres.

32998. That is nearly one rupee an acre. What is the period of settlement?—The new settlement is for 30 years.

32999. Do you consider the settlement heavy?—Not very heavy, provided we get a good outturn. In the poor years we do consider it heavy.

33000. How far is your estate from this river Nerbudda?—My village is about 10 miles off.

33001. How far are you from the forest?—About 18 miles.

33002. Supposing this wood were given you free, would you want the Forest Department to bring it to your door?—I do not want that: all I want is to be given the wood free.

33003. That means you will save 2 pice per head-load and 4 annas per cart-load? Do you think that very heavy?—It is not heavy, but it will induce the cultivators to preserve their cowdung if they get their fuel free.

33004. Do you not grow cotton?—Yes.

33005. What do you do with the cotton stalks?—That is not used for fuel; it has never been used because it is not considered to be good.

33006. We in the Punjab use nothing but cotton stalks, they take the place of cowdung?—That may be the case in the Punjab but the people of these parts do not.

33007. Why cannot you use it if we can?—We can use it, but we are not doing so at present. Moreover our cotton areas are not large enough to allow sufficient supplies of cotton stalks being obtained.

33008. How much cotton do you sow?—Only about 50 acres in my village; cotton, really speaking, is not known in this part of the country.

33009. But every one knows what cotton is. The question is whether cotton would not grow here?—Cotton could be grown but the people are not doing it.

33010. That is not the fault of the Government. Do they impress labour for the railways?—No.

33011. Supposing your labour did not go to the railways, would you find employment for it all the year round?—Yes.

33012. At the same rates?—Not at the same rates as the railways pay.

33013. Why?—Because we cannot afford to pay so much.

33014. Why should you grumble then? Do you want to prevent the men from earning their livelihood?—No.

33015. But it comes to that. You think 4 annas a day reasonable? Can a man with a wife and family live on 4 annas?—The wife is also working.

33016. And the children?—The little children do not do any work but a boy of 8 or 9 years does.

33017. Is even 8 annas a day sufficient for the whole family?—Yes.

33018. What size of holding would you consider to be sufficient for the support of a family?—15 acres.

33019. Of land without any irrigation?—Yes.

33020. And what would be gross income from 15 acres?—It might come to about Rs. 200 a year.

33021. What do you put in the silos? *Juar*?—*Juar* generally: this is the first experiment.

33022. So far you have been keeping *juar* stalks for the winter season?—The stalks are used for feeding cattle.

33023. Do you mix any green stuff with it?—No.

33024. Does nobody in these parts ever mix any green stuff such as carrots and turnips?—No.

33025. Why not?—Because we do not grow turnips and carrots.

33026. *Sir Henry Lawrence*: Have you had any advice from the Agricultural Department on how to make a silo?—Yes, I obtained that advice from the department.

33027. And have you seen silage being made on the farm here?—Yes.

33028. *Sir Ganga Ram*: Have you any tanks in your village?—No.

33029. Not even any wells?—There are two wells only.

33030. No irrigation wells?—No.

33031. Have you any idea as to whether irrigation can be brought here? Have you any idea of tank irrigation?—If any irrigation is possible in my part of the country, it is well irrigation or deep canal irrigation.

33032. From what river?—From the Dudhi river.

33033. Where is that river?—Just on the border of the Narsinghpur and Hoshangabad districts.

33034. Has that been brought to the notice of the Irrigation Department?—Yes: it was under consideration.

33035. Have you a scheme for it?—Yes.

33036. And why was it dropped?—I do not know, but there are some papers about it in the district office.

33037. How far is the river from your place?—About 12 miles.

33038. Is that a tributary of the Nerbudda river?—Yes.

33039. That, you think, is a scheme which would bring irrigation to your estate?—It would command a very large area and at the same time it would pass through large areas under rice.

33040. What is the present yield of your crops? Take wheat for instance?—Not more than four times the seed.

33041. How many maunds per acre?—Not more than 5 maunds per acre.

33042. And cotton?—About 2 maunds.

33043. How much is a maund?—40 seers.

33044. Are you growing ground-nut?—I had been growing ground-nut but owing to the ravages of jackals I have given it up.

33045. Are you troubled by pigs also?—No.

33046. You are troubled by jackals only?—Yes; jackals and crows give a lot of trouble.

33047. Why do you not shoot them?—I do.

33048. Have you any difficulty in getting gun licenses for agricultural purposes?—I, personally, have never experienced any difficulty.

33049. Have the people of your village experienced any such difficulty?—I do not know.

33050. Tell us all your troubles. You have complained about irrigation. What other troubles have you which concern agriculture?—There is no irrigation; there is no pasture land left by Government.

33051. You yourself can reserve land for pasture?—What I mean to say is that the cultivators do not reserve any land for pasture.

33052. That is not the fault of the Government. You can reserve pasture land?—Yes.

33053. Is there any Government pasture land which they do not throw open to you?—No.

33054. Scarcity of labour is one of your troubles?—Yes.

33055. Any others?—Manure is not preserved by the people.

33056. That is the fault of the people. Tell us the troubles for the relief of which Government can come to your assistance?—They can supply us with good implements.

33057. Free?—Not free. They can give *taccavi* loans for long terms at low rates.

33058. You would like to have improved implements?—Certainly.

33059. As regards wells, you say that there is no man to tell you where the water can be found?—That is so.

33060. You can find out by boring?—The people are so backward that they cannot take the trouble to go so far and get expert advice, and therefore Government should come to their aid.

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33061. You work your well by a *mote* ?—Yes.

33062. How many hours does the well keep the *mote* going before it becomes dry? —In the hot weather, it becomes dry in one or two days; it depends on the capacity of the well.

33063. If you work it continuously for one or two days, it will go dry?—Yes, in the hot weather, but not during this time of the year when there is ample water.

33064. You are not confronted with any other trouble?—These are the troubles.

33065. *Sir Thomas Middleton*: How far are you from Hoshangabad? Where is your village?—My village is about 60 miles off from here.

33066. Is it close to a river?—I have got a river in my own village.

33067. You mentioned that you have one well and that you irrigate 20 acres from it?—I do not irrigate 20 acres from the well; I have got 20 acres of land which can be irrigated.

33068. How much can you irrigate in one season?—This year I am irrigating about 5 acres.

33069 At the bottom of page 516, you say that advances should be given to the villagers in kind?—Yes.

33070. Or, if not given in kind, that the malguzars should be told that money is given?—Yes.

33071. And you think that the malguzars will supervise the proper use of the money?—Certainly.

33072. Is that likely? Do you think that the malguzars will take sufficient interest in their tenants to see that they spend their money properly?—Yes. Most of them will do that; those who are well-wishers of the tenants will do it.

33073. How many of the malguzars in your district would you class as being well-wishers?—I think about 75 per cent.

33074. You have 200 acres which you are cultivating yourself, and you have told us the crops you are cultivating. I want to know what area of each crop you grow on your 200 acres: How much wheat do you have this year?—40 acres.

33075. You grow gram; is it mixed with wheat, or is it separate?—It is separate, I grow 40 acres of that.

33076. And how much of *tur*?—About 20 acres; it is a *rabi* crop.

33077. How much *juar* do you grow?—About 40 acres.

33078. And cotton?—Very little this year, about 10 acres, and *til* 10 acres.

33079. How many men do you employ?—I employ 11 servants.

33080. How much would a boy of 8 or 9 years earn?—2 to 3 annas per day, because we keep boys for taking the bullocks and cattle for grazing.

33081. But you engage only one or two boys for that purpose; the boys cannot get regular work with you at 3 annas a day?—It is not regular. Of course, I keep one or two boys for grazing cattle.

33082. A man gets a wage of 4 annas?—Yes.

33083. What is a woman's wage?—3 annas.

33084. How many cattle have you got?—31 cattle.

33085. First of all, you have told us the number of your bullocks?—Yes, it is 16.

33086. But you have some cows?—I have 15 other cattle.

33087. You send these 15 other cattle to the forest for grazing?—No.

33088. You keep them yourself?—Yes.

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33089. You complained that there is no pasture land in your village, but you have told us that they can get grazing for 3 to 4 annas per cow and Rs. 2 per buffalo. Is it likely that, if a man can get grazing at that rate, he will keep land of his own for pasture?—They have to go to the forest.

33090. The forest is not at a very great distance?—It is at a distance of 18 miles.

33091. Is there not the practice of giving the cattle into the charge of a herdsman who takes them to the forest?—That is not the practice. We have to keep our own men.

33092. Even if you keep your own man, you are paying him only 4 annas a day?—Yes.

33093. Is it not very cheap grazing?—Yes, for the man who has a good income, but for the poor people it is rather high.

33094. How can you expect people to reserve a pasture when they can get grazing so cheaply?—Because, when they have got a holding, they must leave a portion for grazing.

33095. You estimate that the yield of average land in your district would be Rs. 13 to Rs. 14 a year?—Yes.

33096. Are you growing any new wheats?—I am growing A. 115.

33097. *Sir James MacKenna*: You are speaking for the Gadarwara Agricultural Association?—Yes.

33098. How long has this Agricultural Association been in existence?—For the last three years.

33099. Who are its members?—There are malguzars and cultivators.

33100. What is the proportion of malguzars and cultivators? Are there more malguzars than cultivators?—They are mostly malguzars.

33101. What are the objects of the Association?—It has to consider how to improve the cultivation.

33102. By what method do they go about doing it?—At present they confine themselves to good seed.

33103. The Association produces good seed?—They have collected some money for the purchase of good seed.

33104. They buy seed from the Agricultural Department?—Yes.

33105. Do you think that the Association is doing any good?—Not much good at present, but it will do good if it goes on with the work.

33106. Is there much enthusiasm?—Yes.

33107. How many non-agriculturists are on the Association?—None.

33108. It is purely agricultural?—Yes.

33109. You say that there is scarcity of fodder in your village. Do you grow *juar*?—Yes.

33110. You do not use the stalks for fodder?—We do.

33111. That meets the difficulty of fodder shortage to a certain extent?—Yes.

33112. Is it not the general practice to cut the *juar* at the top and leave the stalk for grazing?—We also cut the stalks into pieces.

33113. At what depth do you get water when you dig wells?—18 to 30 feet.

33114. What is the cost of digging a well of that depth?—It comes to about Rs. 400 to Rs. 500 per well. I have recently sunk a well, and it has cost me Rs. 500.

33115. Would it not pay you to dig a number of these wells for irrigation of wheat?—It would, but I have got only one well, because we have the river and I am going to set up a pump.

33116. What variety of cotton are you growing now?—Cambodia and *roseum*. I get the seed from the Agricultural Department.

33117. When do you sow it?—In the month of June, just at the beginning of the rains. I grow it without irrigation.

33118. Have you tried cotton before?—Yes.

33119. What kind did you try then?—The *deshi* variety.

33120. How did that pay?—I think it did all right.

33121. What is the position in regard to cotton?—The prices of cotton have gone down since last year, and that is why I have not sown much cotton this year.

33122. You have 4,000 acres of land?—Yes, in the whole of my village.

33123. How much of that is under cultivation?—About 3,500 acres of land is under cultivation; the rest is covered by roads, *nullahs*, etc.

33124. Is there any area available for grazing at all?—We have reserved 25 acres of land this year for the purpose, but many of the tenants live outside the village; they are *pahadis*.

33125. *Prof. Gangulee*: Who is the chairman of your Association?—I am the chairman.

33126. Who is the secretary?—Another gentleman.

33127. Do you meet often?—Once a month.

33128. Regularly?—Not regularly.

33129. When you meet, what do you discuss? Do you have a proper agenda?—Yes, We have discussions about agricultural work. Sometimes, I make some experiments, and I explain them to the other people.

33130. Do you invite any members of the Agricultural Department?—Yes.

33131. Do they come?—Yes, they come.

33132. And discuss matters with you?—Yes.

33133. You said something about the gross income from your crops; what is the cost of cultivation per acre of wheat?—It comes to about Rs. 15 per acre.

33134. What is the cost of cultivation per acre of cotton?—That comes to the same thing.

33135. Do you find one crop is more paying than the other?—Cotton is found to be more paying when we have good prices, but this year we have not got so much profit.

33136. What variety of wheat do you grow?—*Deshi*, and A.115 from the Agricultural Department.

33137. That is a new variety?—Yes.

33138. Do you find that A.115 grows better?—Yes.

33139. And yields better?—Yes, and pay better.

33140. Do you get a premium price from t —Yes.

33141. How many acres of A. 115 have you?—I have 10 acres under A. 115.

33142. Do you sow your own seed?—I have been saving it for the last three years; now it is not so good, so I will change it this year and get it from the department.

33143. You said you grow a certain quantity of *roseum*?—Yes.

33144. Is the *roseum* variety of cotton deteriorating?—I have only sown it for two years; I did not get good prices last year, and this year I did not sow any.

33145. How many labourers have you on your farm?—I have 11 servants, and of course I get other labourers whenever necessary.

33146. You have 11 servants for 200 acres of land?—Yes.

33147. What average wage do you give? You said 4 annas?—Rs. 8 per month.

33148. That works out at about 4 annas a day?—Yes.

33149. Are you connected with the Powerkhera School here?—No, I am not.

33150. Do you know any of the boys there?—I know the boys but I am not connected with it.

33151. Do you know the average messing charge per boy in that school?—No, I do not.

33152. It comes to about Rs. 7-8-0?—Yes, probably.

33153. That works out at 4 annas per day per boy?—Yes, but there is a difference between their food and the food of the labourers in my employ.

33154. On page 517 you speak of the most suitable and useful implements. What sort of implements have you in mind?—I mean motor tractors; they have been found useful in the *sehra* land; but not in the black cotton soil; they have been found very useful in eradicating *kans*; then there is the monsoon plough and the other ploughs.

33155. Are you using any plough?—Yes, monsoon ploughs.

33156. Do you find any difficulty in regard to your draught bullocks?—No.

33157. So that, when you speak of implements, you are referring chiefly to the motor tractor, are you?—Yes, the motor tractor, and other implements; for instance, the winnower and thresher.

33158. Are you using any manure?—Yes.

33159. Any drill?—No, I am not using drills. One drill has been sent by the Agricultural Department to our district, but I have not seen it yet.

33160. Have you any experience in marketing? Where do you market your produce, your cotton and wheat?—In Garrawar and Koralli.

33161. You say the marketing facilities are not satisfactory?—Yes.

33162. On page 518, you speak of the charges of a person who brings *aditya's* letters from the post office?—Yes.

33163. What is that charge?—He takes a handful of grain for bringing a letter from the post office for the *aditya*, the commission agent.

33164. *Mr. Calvert*: What is the price of land around your village?—Rs. 200 to Rs. 300 per acre.

33165. Is the price going up or down?—It is going up.

33166. In discussing indebtedness, you give as one of the reasons the increased standard of living?—Yes.

33167. Is the standard of living rising?—Things are dear.

33168. You do not say that; you speak of the increased standard of living. Has the standard of living risen?—Yes, to some extent.

33169. And you think the standard of living is a cause of their borrowing?—Yes, that is also one of the causes.

33170. *Sir Henry Lawrence*: Have you been engaged in agriculture all your life?—No, my father was an agriculturist; I was in Government service; since I left Government service I have been an agriculturist.

33171. What was your Government service?—I was in the Settlement Department as Assistant Settlement Officer, and I was Tahsildar.

33172. How long have you been managing your own farm?—For the last five or six years.

33173. Do you ever get any officer of the Agricultural Department to advise you?—Yes, often.

33174. What kind of officer?—The Deputy Director of Agriculture, the Extra-Assistant Director of Agriculture, and the Agricultural Assistant.

33175. They all come and see your land?—Yes, and I myself go to Government farms to see things.

33176. Are you a Brahmin?—Yes.

33177. *Sir Ganga Ram*: Are there many Brahmins owning land in this Province?—Yes, in my district there are many Brahmins who are malguzars and cultivators.

33178. How do they get hold of the land?—I do not know the old history.

33179. Was it given to them in charity?—No, not charity.

33180. Then, did they buy land?—Yes, they have bought land.

33181. But how did they become malguzars?—I am sorry, I do not know the old history of how they became, but they have been for many generations in the district.

33182. *The Chairman*: I want to be certain that I do not misunderstand your views about agricultural labour and the possibility of what you call binding agricultural labour by legislation. Would you tell me again quite shortly what your suggestion is?—I mean to say that sometimes it happens that all the labourers go away and leave the village to work on the railway works, and so on. Of course, a certain percentage should be fixed to be kept in the village for agriculture.

33183. But is your suggestion that they should be restrained from leaving the village to take on temporary work?—Yes.

33184. That they should be prevented from leaving the village?—Yes, the contractors should be prevented from taking away the labourers.

(The witness withdrew.)

Mr. K. P. PANDE, LL.B., M.L.C., representing the Tahsil Agricultural Association, Sihora, Jubbulpore.

Replies to the Questionnaire.

Question 2.—Agricultural Education.—(i) There is one agricultural college which is affiliated to the Nagpur University and one agricultural middle school at Powarkhera.

(ii) Owing to shortness of finances, the question of agricultural education has not been taken up on an extended scale though there is an urgent need for extension of teaching facilities in almost all the districts of the Central Provinces and Berar.

(iii) No recruitment of teachers for rural schools should take place from the classes which have no experience of agriculture. In this connection, Government should waive the enforcement of the 25 years rule.

(iv) The attendance is not quite satisfactory when we take into consideration the number of agriculturists, the area under cultivation and the number of boys attending ordinary schools. People have not much faith in the activities of the Agricultural Department, firstly, because they do not want to introduce improved methods of cultivation owing to financial and other difficulties, and secondly, there are no prospects for boys trained at such schools. If the boy passes his middle school examination he can go to the normal school and become a teacher after training, while in case of agricultural education he would have no prospects.

(v), (vi) and (vii) Government should liberally give scholarships and open as many demonstration farms as there may be vernacular middle schools in the district and should also attach one farm to every normal school There are no incentives at present. Yes, modifications in existing courses of study should be effected. Schools in rural areas should have agriculture as a compulsory subject.

(viii) The present state of nature study is such that it encourages cramming and consequently is of no practical use. There are no plots at present attached to schools and the number of demonstration farms is still less.

(ix) There are very few students who have studied agriculture in the existing institutions and almost all of them are in Government service.

(x) Agriculture can be made attractive to middle-class youths by introducing more paying crops, by advancing them capital at a very low rate of interest and by giving them plots for cultivation.

(xi) No steps have been taken for improving the technical knowledge of students who have studied agriculture.

(xii) Adult education in rural tracts can be popularised by opening night schools.

(xiii) Agricultural education should be arranged by District Councils, Co-operative Central Banks and village panchayats. Government of course shall have to retain such powers as they deem necessary for co-ordinating the activities of such bodies. All charges in this connection should be deemed to be charged on land revenue.

Question 3.—Demonstration and Propaganda.—(*a*), (*b*) and (*c*) Intensive propaganda and demonstration have been successful in influencing and improving agriculture. There should be one demonstration plot for a group of 50 villages. All results obtained from experimental and demonstration farms should be printed, distributed broadcast and hung up at prominent places in rural schools.

(*d*) Intensive propaganda for selected seed in Sihora tahsil of district Jubbulpore through private seed farms, co-operative credit societies, the Agricultural Association and by the Department of Agriculture has resulted in the substitution of better yielding varieties in place of the local seed of inferior quality. There are 100 private seed farms which grow and supply selected seeds. Winnowing machines are also becoming very popular.

Question 4.—Administration.—(*a*) There should be no interference from the Government of India. The Government of India may take up only such activities

as may be beneficial to the whole of India. Provinces should be left to develop on their own lines.

(*b*) No.

(*c*) (i) Before the introduction of the Reforms scheme, the Agricultural and Veterinary Services were not in touch with the rural population, but now it has changed and therefore the work of these services is being more appreciated.

(ii) The railways should be prevailed upon to give concessions to agricultural produce and livestock when transported for the improvement of agriculture. In some cases it would be necessary to put restraints on the exports of agricultural necessities such as fodder, bones, oil-cakes, cows and buffaloes of good breeds.

(iii) Roads are one of the most crushing needs of the rural areas. They are the arteries along which the life blood of a district flows.

(iv) The existence of the Meteorological Department is not much known to the agriculturists.

QUESTION 5.—FINANCE.—(*a*) Short-term loans should be advanced by co-operative credit societies and the long-term loans should be advanced by Government.

(*b*) There should be no delay in advancing *taccavi* and land improvement loans. Agriculturists do not anticipate their need before it has actually set in. This habit is certainly not justifiable on their part, but it has to be met all the same. It would be better that a credit limit should be fixed beforehand so that there might be no delay in financing them.

The second cause of its unpopularity is that all sorts of coercive processes are used in making recoveries. This sometimes causes great hardship. If special facilities of summary nature which are given by the legislature to Government for realising its loans were removed or modified, such loans would become popular. If those facilities are to be maintained, then the rate of interest should not be more than 3 per cent.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The following are the main causes:—

(1) Previous loans which have not been cleared off for generations, (2) agriculture alone is not a paying concern, (3) high rates of interest, (4) seasonal calamities, (5) absence of facilities for marketing goods, (6) high rates at which the cultivator has to purchase his necessities of life, (7) size of holdings, (8) excessive fragmentation, (9) deadly forms of cattle diseases, (10) damage to crops by wild animals, (11) factions and litigation, and (12) the land revenue policy of Government.

(ii) Sources of credit—

(1) The village moneylender ...	... 90 per cent.
(2) Co-operative societies, Government and others	... 10 per cent.

(iii) Seasonal and social difficulties are the causes which prevent repayment.

(*b*) The following measures, if adopted, would considerably lighten agriculturist's burden of debt:—

(1) Establishment of Conciliation Boards, (2) better facilities for advancing money at low rates of interest, (3) giving such facilities as may increase the yields, (4) better marketing facilities, (5) elimination of middle men, (6) introduction of more paying crops, (7) establishing agricultural and cottage industries.

The Usurious Loans Act. Such Acts do not produce as much result as is expected of them. In spite of such Acts on the Continent and the United Kingdom, sharks are in existence who can always find out new methods of defeating the provisions of such Acts.

Mortgages should be redeemed and facilities for long-term credit established.

(*c*) As long as arrangements for better facilities are not made, it is not desirable that mortgage and sale rights should be encouraged. If such rights are conceded, it may result in dispossessing 60 per cent of cultivators of their land by moneylending classes. I am against non-terminable mortgages. Without making any enquiry into the economic condition of cultivators, Government cannot take any step either one way or the other.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) and (*b*) Voluntary consolidation of holdings has proved to be a failure. Without making necessary changes in the Tenancy and Land Revenue Acts, no substantial result can be achieved. The obstacles in the way of consolidation are (i) the Hindu and Mahommedan forms of inheritance, (2) conservatism, (3) absence of an agency which can bring about such consolidation and (4) absence of legal provision.

Legislation is necessary for the compulsory consolidation of holdings and for extending the right of pre-emption.

QUESTION 9.—SOILS.—(*a*) (i) *Bunding* of land should be encouraged for the improvement of soil. This system has considerably improved soils of the Jubbulpore *haveli*.

QUESTION 10.—FERTILISERS.—(*a*) Yes, greater use of natural manures and artificial fertilisers can be made. For this intensive propaganda and persistent demonstration of improved methods of their collection and proper application are necessary. The export of such material as may be utilised for manurial purposes should be stopped, such as bones, oil-seeds and oil-cakes.

As long as fertilisers are not manufactured in India and as long as their price have not been considerably reduced, they would never become popular. The immediate problem is how to adjust the prices of these fertilisers to the extra yield which they give. If these fertilisers are manufactured in India, they can be within the reach of everybody. In order to illustrate this point, it may be pointed out that the saltpetre industry of the United Provinces is made a Government monopoly. In such a big country as India is, it is not impossible to find out facilities for the manufacture of artificial fertilisers in some parts of the country, but the matter has not received the serious attention of the Government.

(*b*) To prevent fraudulent adulteration of fertilisers, legislation should be undertaken at once to license dealers in such goods. The Government Chemist may also be instructed to inspect such depôts.

(*c*) To popularise fertilisers, they should be distributed free in the beginning and their results widely demonstrated and published. There should be supply facilities like those of stamps and liquors. They have been tried in the case of more paying crops such as cotton and sugarcane and they seem to have been successful. But it is very doubtful whether in the case of cotton they would be paying in view of the decline in prices.

(*f*) The fuel problem is very important for the poor cultivators. At all the places in such tracts which have very few roads, cowdung has to be used for domestic purposes. Cultivators do realise the manurial value of cowdung, but being helpless they are using it as manure in the absence of other kinds of fuel. In order to deal with this problem, railway companies should be prevailed upon to charge minimum freight on inferior kinds of coal as are not suited for industrial purposes. The number of such coal mines in India is considerable. Many of them are not being worked as their quality does not find a ready market. If such mines can be worked even only by getting subsidies from Government, they should be encouraged to start work. Opening up of Government forests and better facilities should also be considered. In all such areas, where firewood is available owing to the vicinity of jungles, the practice of substituting cowdung for fuel should be seriously dealt with through village panchayats.

QUESTION 11.—CROPS.—The main crops of Jubbulpore district are wheat, gram, oil-seeds and paddy.

The yield of these crops has not been going up. The introduction of selected seeds has resulted in some good to the agriculturists and the dealers in grain.

(*a*) (i) The value of pure and selected seeds is being realised as the crop of such seeds fetches a higher price in the market. The general estimate is that they get from 5 to 7½ per cent more than what they get for their impure and mixed grain.

We think the time has come when the Government should take steps to encourage the certified seed farmer to keep his seed as pure as it ought to be by supplying him seed of new and improved kinds at 5 per cent premium in kind. It is very doubtful that the existing seed of the newly introduced varieties is likely to continue its high yielding nature. It might have been very suitable

to the soil once but now it is gradually exhausting the soil. The question which should be taken up now is, how can fertility of the soil be increased? This means better bullocks, better cultivation of land and better seeds. Unless these three aspects of the problem are taken up simultaneously, no perceptible improvement can be achieved. The cultivator is unable to meet these difficulties because he has not got sufficient capital at his disposal. While during the War prices of cereals had considerably gone up, he was able to purchase his other necessaries out of the profits which he had made in prices. His standard of living has also gone up. The present position is that the prices of cereals have gone down, but there is not a corresponding decrease in the price of other commodities. Labour has also become scarce and dearer than what it was before 1918, the chief causes being:—(1) Rise in prices, (2) the diversion of agricultural labour to other industries which came into existence during the War, (3) the booming of other industries which came into existence after the War out of the capital which had accrued to the country from the profits which India had made during the War. To be short, unless food crops either secure better prices or their yield is increased, the agricultural situation is bound to be gloomy. The problem of manure should also be taken up.

Introduction of new crops requires more money which unfortunately the cultivator does not possess. Moreover, he is not in a position to make experiments which in case of failure may reduce him to a state of utter poverty and indigence. We would suggest that Government should advance money free of interest for the cultivation of new crops for three years to approved and *bona fide* cultivators.

(ii) As regards fodder crops, the question has not been dealt with so far. The difficulty is that the rainfall of the district is about 60″ and the winter minimum temperature is 42° F. Fodder crops excepting grass do not thrive well. In order to solve the fodder problem, it is necessary that we should either have a catch crop or a rotation crop.

Letters to all the Provincial Heads of the Agricultural Departments and to the Pusa Institute were sent by the Association, but no one was able to give sound advice in this matter.

(iii) Selected seeds should be supplied from Government, Court of Wards and certified farms.

A seed scheme sketched out for introducing selected seeds through the Agricultural Association is being tried in the north of the Provinces.

(iv) Clubs for killing wild animals should be established in all affected areas, Government should issue licenses in all such areas where much damage is done by wild animals. Government should also give rewards for the destruction of wild animals. Government forests should not be allowed to continue as breeding farms for such animals. A number of villages in the vicinity of Government forests are the worst sufferers in this respect. It should not be understood to mean that village *shikaris* should have free access to Government forests and be allowed to indulge in slaughtering ruthlessly all sorts of wild animals, but they should be permitted free of charge to kill such animals only as do damage to crops.

(*b*) Greater facilities should also be given to cultivators. No suggestion can be made for any general replacement of the present crops. Along with the existing crops where facilities exist potatoes, sugarcane, ground-nut, chillies and *sann* hemp for fibre may be encouraged. Irrigation facilities from Government tanks for sugarcane and such other crops should be at low rates. The present practice of increasing water rates from year to year is detrimental to the progress of commercial crops which are not yet fully established in the Province.

QUESTION 12.—CULTIVATION.—(1) The tilling of land can be done with bullocks and *bakhars* in the summer season, but ploughing can only be done with ease from the 1st of October to the end of December; unfortunately in this very period cultivators are busy in harvesting their *kharif* crops and in sowing *rabi* crops; preparation of land therefore is never done on a large scale. Government can help in the matter by maintaining regular teams of ploughs and *bakhars* worked by power on the contract system.

The Department of Agriculture through the Sihora Tahsil Agricultural Association has done some work in this connection which has been very much appreciated by cultivators. The demand is steadily growing up but the department is not in a position to help them much. In order to meet the

demand of cultivators steam tackle has been purchased during the present financial year.

(ii) There is no customary rotation of crops and there can be none unless we can find out a second crop which would pay as much as wheat does without in the least affecting the fertility of soil. The present practice is that wheat and gram are mixed up in proportions varying, for example, from 70 per cent to 30 per cent, 90 per cent to 10 per cent and so on. Gram being a leguminous crop helps to maintain fertility of land.

QUESTION 13.—CROP PROTECTION.—(1) There is not much of crop protection in the northern part of the Provinces. Methods suggested by the department are generally expensive and therefore are not taken up. As regards rust, the department has produced varieties of wheat which are able to resist rust.

(ii) It is desirable that cheap methods should be introduced for guarding against infection, but there should be some provision to compel the owners of neighbouring fields to co-operate with each other.

QUESTION 14.—IMPLEMENTS.—(*a*) Before we take to new agricultural implements and machinery, we should see that the existing implements are improved 90 per cent of cultivators live in villages which have absolutely no facility for repairing machinery. Firstly, because spare parts are not locally available; secondly, if they be available, the mechanic is not available; thirdly, prices of such implements are prohibitive; and fourthly, owing to the small sizes of holdings, no ploughing or other agricultural machinery can be successfully employed.

The general opinion is very much against machinery. The working season is so limited and the work is so pressing that the mere idea of breakdown of the machinery prejudices people against it for a number of years.

The manufacture of agricultural implements should be taken up by the Government of India at some central worshop and Government should make no profit over it.

(*b*) Demontrations and exhibitions should be held in all towns having a population of 5,000 people regularly; secondly, there should be facilities for repairing machines; and thirdly, prices of spare parts should not be inordinarily high. Winnowers, ploughs and sugarcane mills are being manufactured in India and are becoming popular.

Private firms should be encouraged in the production of agricultural implements.

As regards their distribution and sale, smaller implements should be stocked by co-operative societies and local bodies.

QUESTION 15.—VETERINARY.—(*a*) There is no reason for the Civil Veterinary Department remaining independent when its objects are cognate to those of agriculture. The Director of Agriculture should be a permanent hand on whom permanent responsibility for running the department should rest. He should have a decent salary and should have nothing higher to look up to. As far as possible he should be an Indian. He should be only an administrative head and should act as Secretary to Government for his departments. We insist on his being an Indian so that the experience which he may have acquired at the expense of Government may not be wasted after retirement.

(*b*) (i) The present dual control and division of expenditure partly by Government and partly by local bodies is undesirable. In its present form local bodies do not realise their responsibility in the matter as they cannot have full control over the working of dispensaries.

(ii) There is need for expansion.

(iii) We have no objection in transferring control to provincial authority provided they can be in touch with local needs.

(*c*) (i) Agriculturists cannot make full use of dispensaries, firstly, because they are not fully aware of their existence, and secondly, because the department is not equipped with facilities for dealing promptly with deadly forms of cattle diseases, and thirdly, because they cannot get hold of the Veterinary Assistant who has to tour throughout the whole tahsil sometimes having a radius of 25 miles. It would be better that for ordinary diseases there should be a man of Lower Subordinate Service in every Revenue Inspector's circle. Unless this is done the department would never be able to do any substantial service to

cultivators. The department should carry on more propaganda than it has been carrying on so far. For administrative control it should remain under the charge of the Extra-Assistant Commissioner of Agriculture. The department should also publish small pamphlets in the vernaculars about various diseases and their medicines.

(ii) We have never been able to feel the existence of touring dispensaries.

(*d*) The first difficulty met with in dealing with contagious diseases is that villagers seldom take their cattle to dispensaries. When an epidemic breaks out on a large scale, its existence is found out and the matter is reported through the police and revenue agencies to the dispensaries, and if the Veterinary Assistant is on tour it goes on spreading and cattle die in numbers. No legislation would be effective unless and until sufficient propaganda has been done to acquaint the people with the department and diseases. Legislation would result in the oppression of poor people by petty officials. It would create a great deal of discontent among ryots.

(*e*) There is difficulty felt sometimes in securing serum in time. It is not stocked in sufficient quantity in the dispensaries and has to be obtained from the Research Institute.

(*f*) Ignorance of villagers and non-availability of serum at the proper time are the obstacles in the way of popularising preventive inoculation. No fee is charged in rural areas.

(*g*) A provincial veterinary research institute should be established in each Province to provide further facilities where they do not exist at present. Officers of both Imperial and provincial institutes should take up the work of research, but the provincial research work should be carried on in consultation with the Muktesar Institute. The general principle should be that the Muktesar Institute should not supplant the local institute. The Agricultural Adviser to the Government of India should be entrusted with the supervision of this department also. Creation of new different heads would be perpetuating the mistake which has been done in the Province.

QUESTION 16.—ANIMAL HUSBANDRY.—Improvement of livestock both for agricultural and dairying purposes is one of the crying needs of agriculturists. Improvement of such cattle would mean better farming, better business and better living. Formerly, the practice was that every householder had a cow which used to supply him with milk for domestic use and bullocks for agricultural purposes. Now he has none. His sons are ill-fed and he has to pay more than Rs. 150 for a pair of bullocks for which he used to pay only Rs. 60 previously. In bigger towns where living is dearer, *gaolas* maintain cows as long as they yield milk and afterwards they dispose them of to butchers. A large number of cows of good milking breed find their way to slaughter houses. In view of the scarcity of agricultural cattle, the high rate of infant mortality and shortness of average length of life, the slaughter of cows should be stopped at once. Improvement of breeds both for draught and milking purposes deserves more attention from Government than it has received so far.

(*a*) (i) Bulls of good breed should be kept for service in a group of 50 villages. They should serve cows brought to them free of all charges. The District Councils, Central Banks and other local bodies would be too glad to maintain such bulls. The practice of Government to discourage *Brahmini* bulls should also be given up.

(ii) The dairying industry in India cannot flourish unless Government does something to check the import and adulteration of *ghi* and the practice of adulterating milk with water.

(b) (i) There is no over-stocking of common pasture. What is being done is that all good pastures are being converted into fields. Over-stocking is now an exception.

(ii) Grass borders in tilled fields are also being reduced.

(iii) The export of dry fodder should be discouraged by legislation. Wheat straw is being exported from some of the districts of the Central Provinces to the United Provinces. In many cases, cattle have to find out fodder for themselves. In the majority of cases there is no stall feeding, the consequence is that cattle are deteriorating physically and dying prematurely and sometimes they are slaughtered for meat purposes.

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(iv) Cultivators would not grow green fodder in dry seasons unless they can be convinced that fodder crops would pay them back. Unless dairying industry is pushed forward by Government, cultivators are not likely to do anything substantial for maintaining their cattle.

(v) They do not get sufficient mineral constituents in their food and therefore the salt tax should be abolished altogether. From the figures of the Government of India it is clear that when a high duty is imposed on salt its consumption goes down and when its tax is reduced, consumption goes up. Government is, therefore, not likely to lose much in the long run. There is no reason why the manufacture of local salts should be discouraged.

(*c*) Fodder shortage is most marked in the months of December, January and February and during the rains. Cattle get fodder of poor quality throughout the above period, and they take about four weeks to come to their normal state afterwards.

(*d*) Government forests should be opened; new catch crops and rotation crops should be experimented on. Seeds of good grasses should be supplied, and the weeding of obnoxious weeds should be encouraged.

(*e*) Any encroachment on village pastures should be severely dealt with. Provision should be made in the Land Revenue and Tenancy Acts for maintaining enough pasture land in every village; all pasture lands should be specially marked and set apart on the village maps. In all settlement operations such lands should be revenue free.

If the landowners be exempted from the payment of land revenue over pasture lands, they would keep such areas for grazing purposes. The practice of the Central Provinces Government in recent settlements has been to assess even the grazing areas. If the State were to make a little sacrifice, we are sure that landowners would respond much more liberally. It is absurd on the part of Government to expect landholders to make concessions when they themselves are not prepared to do anything of the kind. Secondly, where there are irrigation facilities, cultivators should be given special concessions to grow *sann* hemp in dry season with the help of irrigation water which will serve the purpose of green fodder for cattle in summer and that of manure for the succeeding crop of rice in the same season.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) It is very difficult to give an accurate estimate of the number of days for which a cultivator has to work on his holding during the year. Conditions vary from tract to tract. In many places he has to be busy throughout the year, especially in double-cropped areas where he has to look after his fields either in their preparation, sowing, harvesting of crops, but it can be safely said that, with the exception of 6 months, he can more or less busy himself with subsidiary industries and can safely devote a part of his time to them. For 3 months generally, he has not got much work for the whole day. In the case of *kharif* crop areas, he has 6 months leisure if he does not move about.

(*b*) and (*c*) Subsidiary industries can be encouraged by supplying cultivators money at low rates of interest, by doing experimental and research work, by keeping mechanics to repair their machines, by supplying them with goods, by eliminating as many middlemen as possible, by arranging markets for them and by patronising and purchasing such locally manufactured goods.

The following subsidiary industries can very well occupy their spare time:—

Cording, spinning, weaving, carpentry, smithy, silver smithy, tinkering, lace making, dyeing and painting, match making, knitting, *bidi* making, carpet and *niwar* making, paper and card-board manufacturing, hulling, milling, preparation of pulses and oil pressing.

(*e*) Government should do all experimental work in connection with the above subsidiary industries. The move of industrial concerns to rural areas would mean the ruin of agriculture as the tendency is that agricultural labour is paid in kind. Moreover, labour is better paid in other industries. Industrial concerns will pay better wages and besides they would be able to employ their men throughout the year. The result would be that there would no labour be available for agriculture.

(*f*) A more intensive study of each rural industry should be made. It would not be out of place to suggest that an exhibition pertaining to agriculture and

industries subsidiary to it should be held in Provinces turn by turn every year. In such exihibitions practical demonstrations of agricultural machines, implements and tools of industry should be given. Railway companies should be induced to give special concessions to exhibitions and visitors intending to visit such exhibitions. If exhibitions are held and exhibitors are encouraged to demonstrate the utility of tools and machines, the whole thing can be studied at a glance. The introduction of new crops such as sugarcane, potatoes, vegetables, etc., where they do not exist and where there are facilities for growing them, might lead to greater rural employment.

(*h*) Agriculturists cannot devote their spare time to improve the health conditions of their own environment unless Government comes forward with liberal grants for encouraging such efforts on their part. Government ought to have a clear cut scheme about sanitation of rural areas which have been all along neglected.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) Generally, there is no surplus of labour. It moves about for a few months then comes back to its original place. Our impression is that Indian labour is sufficiently mobile, unless there are other difficulties such as housing, malaria and harsh treatment. Wages alone ought to attract labour. So far as it is known, with the exception of certain tracts of the Central Provinces, not much fallow area is available for cultivation. There is some land available in hilly and jungly tracts, but owing to communication difficulties it is doubtful if outsiders will go and occupy such areas. Such areas should be freely leased out to emigrants in blocks of 10 acres with Government financial aid and fixity of tenure. We are against large farms which are not common in India where cultivation is not carried on primarily for commercial purposes.

(*b*) Shortage of labour is due to—

(1) epidemics to which hundreds of thousands fall a prey, (2) weak physique due to malnutrition, (3) diversion to mill areas and other industries which can provide them with better wages and work for the whole year, (4) migration of labour to other Provinces.

This state of affairs cannot be remedied without making agriculture a paying concern and without introducing subsidiary industries. If agriculturists could pay better wages, labourers would flock to rural areas as they would prefer their homes to dirty slums in which they have to reside in mill areas. Preventable diseases, such as malaria, cholera, victimise a large number of labourers. If Government were to pay a little attention towards sanitation and medical relief, the population might double itself in twenty years.

(*c*) Areas not at present under cultivation should be leased out rent free at least for ten years and afterwards rents on a sliding scale should be charged. The Government should never take as rent more than 1/10th of the gross profits; this should be the highest standard. Such profits would not be arrived at without consulting local bodies such as village panchayats, co-operative societies and district boards. The demands made are modest ones when we consider that in the majority of countries of the continent, lands are held free for generations when they are newly brought under cultivation. The State is not getting any profits from fallow lands and consequently it should welcome any such move as might give it some return after a few years. The Governments of other countries encourage agriculture because they cannot grow sufficient food in their own countries. But in India it is neglected as it is never treated as an industry though the food problem in India is as acute as in any other country.

The question of moving labour from one place to another is not a sound one. If Government seriously takes up the question of agricultural improvements and cottage industries, it will mean employment for them for the whole year. On the contrary, if such labour is moved from its original place to some other place, it may act as the greatest obstacle in the progress of agricultural development of the country. Devoting too much attention to more paying commercial crops such as tea, jute, coffee, etc., will not be an unmixed good. Food crops should receive sufficient attention before other kinds of crops are introduced. Without wholesale economic rehabilitation in rural areas, it is well nigh impossible to introduce other kinds of crops. I do not mean to say that commercial crops should be ignored. It is a matter of common knowledge that the introduction of machinery itself requires at least as much labour as is required for doing the same work by manual labour if not more.

Introduction of labour saving machines will mean greater profits and consequently greater capital for investment in other forms of industries.

It will be, therefore, a mistake to make labour move from one Province to another when there is a probability that in a few years the area so denuded of labour may require it for itself.

QUESTION 19.—FORESTS.—(*a*) and (*b*) No; we do not consider that full use of the forest lands for agricultural purposes is at present made. It is very difficult to find out what is meant by preservation of forest areas. More grazing facilities can be given. It would be better if the Forest Department should take up the question of improving the quality of forest grass and of growing new fodder crops. Forest areas should also be leased out for cultivation, cattle-breeding and dairying purposes wherever possible. Construction of forest roads to facilitate communication should be started. They should supply seeds of superior kinds of grasses. The present hap-hazard system of growing fodder should be stopped and the work of growing better fodder crops on systematic lines should be undertaken.

(*c*) Soil erosion due to deterioration of forests is not marked in the Central Provinces at least and there is sufficient rainfall here.

(*d*) There appears to be no need for further afforestation at present.

QUESTION 20.—MARKETING.—(*a*) Agriculturists should be given full facilities for selling their produce in markets. A sufficient number of roads should be provided in rural areas. Light railways should be constructed along with roads. District Councils should be encouraged to take up construction of such railways. Middlemen should be eliminated as far as practicable. Co-operative purchase and sale societies should be started in grain markets. It is necessary to take more effective steps to place at the disposal of cultivators, merchants and traders information as to market conditions, crop returns, complaints as to Indian produce and agricultural and marketing news in general.

QUESTION 22.—CO-OPERATION.—(*a*) The following steps should be taken to encourage the growth of the co-operative movement:—

(i) The Government should help the movement by maintaining a qualified and adequate staff. (2) The Trust Act should be amended to the effect that trust money may be deposited in the co-operative banks. (3) District Councils and Municipal Committee should be allowed to deposit their surplus funds, etc., in the Central Banks. (4) State aid should be given to land mortgage banks and housing societies. (5) Money should be advanced to non-official organisations for propaganda work.

(ii) Local bodies should be allowed to keep their money in the Central Banks. (2) They should appoint organisers and give them training in co-operative principles.

(*b*) (i) Credit societies require more education.

(ii) Establishment of purchase societies is very necessary. In order to eliminate risks we would suggest that before placing an order indents may be invited.

(iii) Forming of societies for the sale of produce or stock is necessary. Such an experiment is being tried in Berar.

(iv) Societies formed for effecting improvements should be advanced money at very low rates of interest. The number of instalments should also be more liberal.

(v) Voluntary consolidation of holdings is not likely to succeed.

(vi) Agricultural machinery of crude and simple types can be co-operatively used. The difficulty is that machines cannot be easily repaired in villages.

(vii) Societies for joint farming have not been established so far though the experiment is worth trying.

(viii) Cattle-breeding societies have proved a failure in the Central Provinces, but the experiment may be tried again. Government should supply breeding bulls free of charge and forest areas should be freely opened for grazing. Veterinary Assistants should be asked to supervise the general health of the herds periodically. Slaughter of milch cattle and other agricultural cattle should be stopped. Societies for fighting diseases should also be established.

(c) To work co-operative schemes for joint improvement legislation will certainly be necessary. There are people everywhere who are the worst enemies of all kinds of improvements howsoever important and beneficial they may be. We do not mean to say that such men should be compelled to become members of the co-operative societies but we should certainly insist on compelling them to effect improvements otherwise.

(d) Societies have not done as much good as was expected of them, the main reasons being:—

(1) Agriculture is not a sufficiently paying concern. Practically no margin is left after meeting expenses of the year. (2) The rate of interest is high. (3) Absence of facilities for improving cultivation. (4)The land revenue policy of Government which by one settlement operation takes away what cultivators have achieved.

QUESTION 23.—GENERAL EDUCATION.—(a) In view of agricultural education having come under the control of the University, it is likely that there would be a separate course prescribed in agriculture. It should be an optional subject and it should generally concern itself not so much with field work as with farm economics including the budget of agriculturists. Up to this time unfortunately farm economics has not received any attention, but in view of the newly created interest in agriculture this branch of economics cannot be neglected any longer.

(b) Rural education should be in conformity with the needs of agriculturists. It has neglected agriculture so far with the result that boys do not pick up anything of agriculture in schools. As the majority of boys do not go to the middle schools, it is absolutely necessary that they should be given training in agriculture in primary schools.

This teaching should be practical in nature and should not be bookish.

Compulsory education has not been introduced in Jubbulpore district. It has been introduced in some districts of the Central Provinces recently. It would be, therefore, premature to express any opinion about it. Boys of tender age who are quite unsuitable for purposes of agriculture attend classes but when they grow up, they go to the plough and help their parents in carrying field operations. The shortage of labour and the grinding poverty of their parents deter them from prosecuting their studies further.

QUESTION 24.—ATTRACTING CAPITAL.—(a) Unless agriculture becomes paying, capitalists are not likely to take to agriculture for cultivation purposes. The present tendency is that land is passing away from the hands of hereditary agriculturists to moneylenders who generally retain such villages as an outlet for investing their money and grain at high rates of interest which they can charge and realise because they are the owners of villages.

(b) The settlement policy of Government is tending to discourage owners of agricultural land from carrying out improvements. The land revenue policy of Government which has been studiously and religiously excluded from the terms of reference of the Commission is primarily responsible for the poor state of agriculturists.

QUESTION 25.—WELFARE OF RURAL POPULATION.—Indians by temperament are not such dirty people as they are represented to be. Their religious ceremonies, personal hygiene as is enjoined by their religious books, religious festivals and worship, clearing of villages when epidemics break out, the sweeping and whitewashing of every nook and corner of the house, the application of cowdung to the floor and the planting of various shrubs in the courtyard and other places are important factors which go a great deal towards keeping the villages clean.

Unless the Government gives them more money, they cannot do anything more. Medical relief, sanitation of villages and communications deserve the attention of all well-wishers of agricultural classes.

Data for farm economics should be collected. Such enquiry should be conducted not by the executive officers of the land but by professors and students of the University. It is a new science in India and consequently collection of data would take a long time before any tangible results can be obtained. Retired servants of the Co-operative, Agricultural and Land Records

Departments should be encouraged to take up this work. The scope and methods of such enquiries would differ from tract to tract. No hard and fast rules should be laid down in the initial stages. For reasons best known to Government, they have all along avoided an enquiry into the economic well-being of the people. The non-official opinion is diametrically opposed to the official view. They think that there is nothing economically wrong.

We have been closely connected with the co-operative movement and we find that, on an average, debt per head has been increasing from year to year. Our own impression is that this increase in debt is not due to their economic improvements.

QUESTION 26.—STATISTICS.—The work of ascertaining areas under cultivation and crops is already done by village *patwaris*. The substitution of any other agency would be rather expensive. The work of estimating the yield of agricultural produce should never be done by the executive officers who in the majority of cases have no knowledge of agricultural matters. They do not make sufficient margin for losses in harvesting, gleaning, threshing, winnowing, etc. Estimates by Government are considerably higher than those of private persons. The present method of taking only 1/10th of an acre for crop experiments deserves to be abolished and deserves to be replaced by some other more reliable method. The work of arranging and publishing agricultural statistics should be done by the Department of Agriculture.

The science of agricultural statistics is also a new one. Some persons should be deputed to study the American system of statistics.

Oral Evidence.

33185. *The Chairman:* Mr. Pande, you wish to be examined on the note provided by the Tahsil Agricultural Association of Sehora?—Yes.

33186. Would you like to make any statement in amplification of your note, or may I ask you some questions?—You may ask me questions; I may have to say something about co-operation, but I will do that later on.

33187. Are you a cultivator?—Yes.

33188. Would you tell us a little about your holding; how big is it?—The area that I cultivate is about 1,000 acres.

33189. Do you cultivate that 1,000 acres by hired labour?—Yes.

33190. Do you pay that labour in cash or in kind?—Both.

33191. Do you pay the same labourer partly in cash and partly in kind?—Yes; in that way the labourers dictate their own terms.

33192. Then apart from that 1,000 acres, what land do you own?—I also own 9,000 acres.

33193. That is 10,000 acres altogether?—Yes.

33194. Do you own the 9,000 acres in malguzari right?—Yes.

33195. Is the other 1,000 acres home-farm?—Yes. The whole area of the home-farm is 1,500 acres, but I cultivate only 1,000 acres.

33196. Of this whole area of 10,000 acres, how much, if any, is irrigated?—There is no irrigation in my part of the Province.

33197. No well irrigation?—There is well irrigation, but it is negligible.

33198. But still, you know, small experiments are important?—I have made experiments myself.

33199. And what is the result?—The result is satisfactory, but it is impossible to carry it on on a large scale.

33200. Why?—Firstly, the nature of the soil is such that it cannot stand irrigation.

33201. Does it become saline?—Yes; if you take a village of 500 acres, there may be 10, 20 or 50 acres at most that can stand irrigation.

33202. The rest goes salt?—Yes, and the soil is such that huge cracks appear.

33203. Is it the black cotton soil?—It is not exactly cotton soil, but it is black soil.

33204. Is there any clay in it?—There is.

33205. In patches?—Yes, in a village we have a number of soils; part is of one kind and part of another.

33206. So that it is only a small part of the area that is capable of being irrigated?—Yes.

33207. What are your crops on your home-farm?—Wheat, gram and paddy are the three main crops.

33208. Is that dry or irrigated paddy?—Naturally irrigated paddy.

33209. You do irrigate the paddy?—No, it is not irrigated; the system is that we have *bunds* and the land is water-logged.

33210. Do you grow any cotton?—No.

33211. What varieties of wheat are you growing?—No. 88, No. 90 and other improved varieties.

33212 Are they recommended by the Agricultural Department?—Yes.

33213. Are you satisfied with them?—Yes.

33214. What gram do you grow?—I use the *deshi* or local variety.

33215. Do you think the local *deshi* gram seed is capable of improvement?—Everything is capable of improvement.

33216. That is a very safe answer. What is the average outturn of wheat in the average year?—It is about four times the seed rate.

33217. Do you manure at all?—Manuring cannot be done on a large scale; whatever manure we have we use for paddy.

33218. Are you convinced that it would not pay to apply artificial manures?—No, it will not pay.

33219. You are satisfied of that?—Yes.

33220. How do you know?—The difficulty about artificial manure is that their prices are rather high, and if I use manure costing about Rs. 5 per acre, I must be satisfied that at any rate I shall get Rs. 6 in extra crop, but it does not come up to that; that is one difficulty.

33221. Will you tell me upon what experiments you found your views? Have you tried artificial manures?—Yes, I tried them, I think it was in 1920 and 1921.

33222. Was 1920 a very good or a very bad year?—Prices were high.

33223. What about crops?—I found I did not get as much crop as I ought to have.

33224. But was not 1920 a very dry year?—I cannot remember. I think it was a dry year.

33225. It was a year of crop failure, was it not?—I think there were three successive failures of crops in 1920, 1921 and 1922.

So that you made an experiment in what, as far as you can remember, was a year of crop failure, and upon that you formed the view that artificial manures would not pay.

33226. *Prof. Gangulee:* What was the crop on which you used the artificial manure?—I think I used it on wheat; we sow wheat and gram together.

33227. *The Chairman:* Now tell us about any other difficulty?—Another difficulty is that in order to use these manures you must irrigate the land; but we are not in a position to do that.

33228. Have you ever tried cowdung?—We try that every year.

33229. On wheat land?—Not on wheat, but on paddy.

33230. Have you ever tried it on wheat land?—No, we have not a sufficient supply.

33231. You need the whole of it for your rice?—Yes, the whole of it is used on paddy.

33232. How many pairs of bullocks do you keep?—I keep about 80 pairs of bullocks.

33233. Have you any suggestions to make to the Commission as to how the difficulty of keeping these bullocks in condition in a season of fodder shortage could be achieved?—There is fodder shortage; there is no doubt about it.

33234. Have you made experiments?—Yes.

33235. What did you try?—I tried *juar;* but the difficulty is that it could not withstand the rainfall. The rainfall of my district is something like 60 inches and every third or fourth year it may even go to 70 inches; moreover the winter temperature is so low that *juar* cannot thrive.

33236. Have you considered at all the possibility of growing Guinea grass or lucerne?—I grew lucerne once; but I cannot say whether it was a success or not. It is doubtful whether we can use it for draught cattle; it may be all right for milch cows but for draught cattle it does not pay.

33237. Do you keep accurate and complete costings of your farming operations, detailed accounts showing the cost of production on a given unit and the return?—Yes, I do.

33238. *Prof. Gangulee:* What is the cost of cultivation per acre of wheat?—It varies in different tracts; if you are situated near a railway station or a big town, for example, it may cost you Rs. 20; but if you are far away from a railway station it may cost you less.

33239. What is the cost of cultivation per acre on your own farm?—Rs. 10.

33240. *The Chairman:* Do you lend money to the villagers in your malguzari areas?—Yes.

33241. At what rate?—It varies from 12 to 24 per cent per annum.

33242. It has occasionally been suggested before the Commission that there should be a statutory limitation of the rate of interest. Do you agree with that view?—Yes, provided the State were to come forward and find the money for the cultivators.

33243. Are you lending any seed at all to your cultivators?—Yes.

33244. On what terms?—At 25 per cent per annum.

33245. In kind?—Yes, in kind.

33246. *Dr. Hyder:* Not on *sawai* or *derhi*?—*Sawai* means 25 per cent. You have got also 50 per cent in districts like Mandla. I have got a scheme of my own which will reduce the rate.

33247. Have you included that scheme here in your note?—No.

33248. *The Chairman:* On page 529 you suggest: "Agriculture can be made attractive to middle-class youths by introducing more paying crops, by advancing them capital at a very low rate of interest". That would be at the expense of the general tax-payer, would it not?—The thing is this: if you take the entire revenue of the Central Provinces it comes to something more than 5 crores and out of this 2½ crores is derived from land revenue alone; so it cannot be said that it is taxing the general tax-payer.

33249. So your view is, I suppose, that you are taxing other agriculturists to provide cheap rate of interest for this class?—The present position is that agriculturists are taxed for the benefit of other people.

33250. You say: "Adult education in rural tracts can be popularised by opening night schools." Is that view founded on any definite experience of yours?—I have tried some experiments and I have succeeded also. I am the Chairman of the Sehora Central Bank and there the experiment was tried.

33251. Would you tell us a little more about it?—It had to be given up because the Bank had not sufficient funds.

33252. How long was the experiment carried on?—For three months.

33253. You think you can come to any very clear conclusions about a scheme of adult education in three months?—I say that people wanted it but the difficulty was want of funds.

33254. How many people attended in the beginning of the three months?—Thirty.

33255. How many were there at the end of the three months?—Not more than five. The whole thing depends upon the amount of pressure which the malguzar can exercise on the people.

33256. On page 530, in answer to Question 4, you say: "Before the introduction of the Reforms scheme, the Agricultural and Veterinary Services were not in touch with the rural population". Surely the Veterinary Services in the districts have been in the hands of the District Boards for a long time, have they not?—We have got the dispensary; but the veterinary officers are under the Central Government.

33257. The dispensary is in the hands of the Local Boards?—Yes, but we have not got any control over the Veterinary Assistant.

33258. Are you not responsible at all for the way in which the business of the dispensary is carried on?—We are responsible only for payment; we cannot lay down principles for carrying on the dispensaries. So the best thing is that the services of the Veterinary Assistants should be transferred to the local bodies..

33259. Is it your view that the local authority would be prepared to take responsibility for the administration and work of the dispensary?—Yes.

33260. You would like to see that done?—Yes, provided also that the Government gives the funds which it is already spending on it.

33261. *Prof. Gangulee:* Are you a member of the District Council?—I am the Vice-Chairman of the District Council and Chairman of my Local Board.

33262. *The Chairman:* In the matter of finance, in answer to our Question 5, you say: "There should be no delay in advancing *taccavi* and land improvement loans". Is it your view that there is undue delay in advancing these *taccavi* loans?—Yes.

33263. Is there more delay than is required for the officer who is responsible to make a complete enquiry into the justification for the application?—That is a matter for the authorities; I cannot say.

33264. You have to consider this question in relation to the responsibility of the officer who is to decide as to whether the public money is to be advanced to an applicant or not. It would not do to lend Government money without proper enquiry, would it?—But the procedure can be simplified.

33265. You think it can?—Yes.

33266. Who do you suggest should be responsible? Have you thought out any scheme?—The best thing is that these loans should be advanced through co-operative societies.

33267. Have you got any co-operative society on your 9,000 acres?—Yes.

33268. How many?—I have to manage over 13 villages and in 7 I have got co-operative societies.

33269. Are they working?—They are working well.

33270. Are they utilising all the available money for loans?—They can get money from the Central Bank.

33271. Then why do you suggest that *taccavi* should be made available?—The thing is this: they get money at 12 per cent from the Co-operative Central Bank, while from the State they can get it at about 7 or 8 per cent; this is cheaper. Moreover all cultivators are not members of the societies.

33272. Do you believe in the co-operative movement?—I do.

33273. You think it will be a good thing for the co-operative movement if *taccavi* loans were made readily attainable and were granted at lower rates of interest?—Yes.

33274. You think that will be a good thing for the co-operative movement?—Yes.

33275. Your suggestion is that the primary credit societies should be financed by *taccavi* loans and not from the Central Bank?—No, that is not my suggestion.

33276. Then how do you propose to do it?—A cultivator who is not a member of the co-operative society can get a loan from the Government and I suggest that such a loan should be advanced through the co-operative society.

33277. To non-members?—Yes.

33278. Would you make the co-operative societies the judges of whether an application was justifiable or not?—Yes.

33279. But the co-operative societies would have no responsibility for repaying Government, would they?—We are prepared to have that responsibility provided we get some commission on the whole thing and it can be done like this: supposing the State advances to them at Rs. 7-12-0 per cent, if co-operative societies guarantee payment then Government may advance the money to the societies at 6 per cent.

33280. At what rate does the primary society in your district borrow from the Central Bank?—12 per cent.

33281. At what rate do you suggest the primary society should be lent money as *taccavi* loan?—That is not my position; I do not want that it should be advanced from the State entirely.

33282. If *taccavi* loans were available to primary societies at rates of interest lower than the primary societies can borrow from the Central Bank, would it be good for the business of the Central Bank?—If they get loans at about 7 per cent then they will have to enhance the rate when they advance to individual members; secondly, State aid to that extent is not desirable; thirdly, I doubt whether the State will be in a position to help to such an extent.

33283. Have you studied the working of the Usurious Loans Act in this Province closely?—It is not in force in this Province; I think it is only in force in the Punjab.

33284. Only in the Punjab?—I think so.

33285. Is it not an All-India Act?—At any rate, I am not aware of its existence so far as this Province is concerned.

33286. The position is that it is an All-India Act and it is open to Provincial Governments to put it into force or not to put it into force. It is in force in Berar but not in the other half of the Province?—In Berar, they have the *damdopat* system.

33287. But the *damdopat* system is not the same as the Usurious Loans Act?—In Berar, the *damdopat* system applies to Hindus.

33288. That has nothing to do with the Usurious Loans Act?—*Damdopat* serves the same purpose.

33289. "Voluntary consolidation of holdings has proved to be a failure", you say. What attempts on a voluntary basis have been made in this Province?—It was attempted in Chhattisgarh Division, but only in a very limited manner.

33290. Are you quite sure that the voluntary method has been fully tried?—I think it is bound to fail.

33291. *Mr. Calvert:* You saw it in the Punjab, did you not?—Yes.

33292. It did not fail there?—No, because it was tried in less than 300 villages, and that touches not even the fringe of the problem. And again the position in the Punjab is entirely different from the position in these parts. Here we have got the *bunding* system, whereas in the Punjab you have got one plain surface and it is easy to adjust one plot with another. That sort of thing cannot be done here.

33293. *Sir Henry Lawrance:* Your soil varies here, does it?—Yes.

33294. *The Chairman:* On page 531 you say, "It is very doubtful that the existing seed of the newly introduced varieties is likely to continue its high yielding nature"? Is that because of a probable deterioration in the varieties or because of the effect on the soil of better varieties season by season?—I think it is due to the soil.

33295. You give on page 532, as one of the reasons for the progressive shortage of labour, the rise in prices? How does the rise in price bring about a shortage of labour? That accounts for the labour becoming more dear, I suppose?—Yes.

33296. You say "diversion of agricultural labour to other industries which came into existence during the War"? What industries are you thinking of?—The cement factories at Katni in the Jubbulpore district; also the development of Tata's works.

33297. Are those cement manufactories still in being?—Yes, there are three factories.

33298. *Prof. Gangulee:* How many labourers do they employ?—I cannot say definitely, but I think they must be employing about 6,000 people.

33299. *The Chairman:* Have you any suggestions to make as to how these difficulties might be overcome?—I have suggested the introduction of subsidiary cottage industries.

33300. Would you like to see local authorities purchasing steam tackle in order to undertake ploughing on a contract basis?—If you mean District Councils, my answer is in the affirmative.

33301. You suggest that the department should do it?—Yes, I think the Department of Agriculture should do it; it is impossible for the ordinary people to take it up.

33302. Why?—It would mean so much money which they do not possess and it is doubtful whether the thing would succeed.

33303. You are not very hopeful about it?—Not much.

And very wisely you suggest that the department, with which you have no connection, should take the risk.

33304. Have you any experience of the method of preserving fodder known as silage?—Yes.

33305. Do you practise that?—Yes.

33306. For how long have you practised it?—For the last three years.

33307. Do you find it a success?—Yes.

33308. And you believe in it?—Yes.

33309. Are you making your silage in pits below the ground?—Yes.

33310. Are you having any difficulty at all?—Up to this time I have not experienced much difficulty, except that I cannot do it on a large scale.

33311. Why not?—Because I have not got sufficient fodder.

33312. Have you had any disappointments? Has any of it gone bad?—Only a small portion of it.

33313. Just on the top and the sides?—It is generally lower down.

33314. You find your animals eat it readily?—Yes; I use it for milch cattle only.

33315. Do your villagers take any interest in it?—No.

33316. Have you attempted to show it to them?—It is done in the village itself, but they do not maintain many milch cattle as a matter of fact.

33317. I see you suggest that *sann* hemp should be grown under irrigation for green fodder? Do you think that is the best green fodder that you can grow?—I have said that it would serve two purposes; firstly, for green fodder, and secondly, for manure.

33318. I observed that; but do you think it is a good green fodder?—I cannot say anything about that.

33319. I just want to be certain as to what you mean when you say that the demands that you are making on Government funds are modest?—Of course modesty is a relative term; they are modest when we consider the demands in the majority of the countries of the Continent?

33320. Which Continent do you refer to?—I think the European Continent.

33321. Where do you market your wheat?—In the local market.

33322. Are you satisfied with the prices you get?—Not at all.

33323. Could you not market it to a merchant direct?—I have not yet been able to get such a merchant.

33324. Do you get the ordinary rates for wheat grown on your own farm?—I get a slightly better price.

33325. Why?—Because I produce purer stuff. What the merchants do is this: they take wheat of all kinds and mix them with mine and produce standard quality. In Bombay there are different qualities, for example, 70 per cent pure and 30 per cent dirty. If they want to produce another combination they just mix mine and bring it to the required standard.

33326. You suggested at the commencement of your oral evidence that there was something that you wished to add to that statement. Would you let us hear what it may be?—I wanted to mention two things in this connection: firstly, my seed scheme and secondly, the system of tenancy which we have in the Central Provinces. The tenure of land is such that there is absolutely no value for the land.

33327. You know the subject of tenancy is not within the terms of our reference. We are quite prepared to hear the effect that present conditions have on your cultivation if you wish to tell us, but we are not prepared to hear any proposals for a change. Do I make myself clear?—Our difficulty is that the two questions are so mixed up together that you cannot examine the former without examining the latter also.

33328. Proceed with your statement and I will stop you if necessary?—The difficulty with regard to the system of tenure is that the co-operative societies have absolutely no assets. Members hold their land on occupancy right only and they have consequently nothing to mortgage. Then after taking large loans they apply to the law courts and get themselves declared insolvent, with the result that the money is lost to the Central Bank and to the society. The remaining members are required to pay up for one man's dishonesty.

33329. Before you go any further I want to ask you a question on that. You have several primary societies on your own estates?—Seven societies.

33330. How many of them are really being managed efficiently by their own members? Are they in fact managed by committees of the primary society or are they really there simply as links between the individual borrower and the Central Bank?—Out of these seven societies I think only one can exist without any aid from outside.

33331. Take that society which is the best you have. Does the committee make a close scrutiny of the applications for loans that come in to the committee from its members?—They do.

33332. So that they ought to know which of their members, if any, are deserving of a loan?—Quite so: but you cannot know when the man will become dishonest. He might be honest to-day but what is there to prevent him from becoming dishonest to-morrow?

33333. Do not let us take too gloomy a view. Probably it would be all right if you did not take such a pessimistic view as you have taken. You do not think that the co-operative society through its committee is capable of judging as to whether its members ought to be given loans or ought not to be given loans?—They understand their interests best, but the difficulty is that they would not know what the man might do afterwards.

33334. In all businesses you expect to meet a certain proportion of dishonest people and you must expect to be faced with a certain number of disappointments and bad debts. Dou you not think that the primary society, if properly managed, is capable of protecting itself against the ordinary risks of business in those respects?—It is well qualified to protect itself, but even in the best joint stock banks you will find that fraudulent transactions take place.

33335. You say that the other societies are not capable of managing their own affairs?—Yes.

33336. Who examines the applications that come in from their members for loans?—What I say is that they cannot exist without outside help.

33337. Who examines the applications?—The applications are examined by the members of the societies themselves, but the Central Bank lends them a clerk who writes out their accounts, dratts their applications, and does other things.

33338. Do you think that the principle of unlimited liability is not capable of stimulating the members into a sufficiently wary frame of mind to look after themselves?—It does. In the beginning, before the principle of joint responsibility was enforced, they were reckless, but now they are cautious.

33339. To come back to your point, you think that it is impossible to conduct credit societies unless the members have land which they can mortgage?—That is not my intention. In order to put the whole thing on a sound footing the nature of tenancy should be changed. In this connection, an amendment of the Insolvency Act is also necessary; that is my point.

33340. Would you tell us what you wish to be done in the way of amendment?—That a man will not be allowed to become insolvent as long as he has property; that he will not be allowed to surrender his holdings to the malguzar as long as he has got debts owing to a co-operative society.

33341. You want to put the co-operative society in front of the *sowcar*?—Yes, I am expecting to get the same right which the Government has over them.

33342. Have you got anything else to say?—About the staff of the Co-operative Department, the position in the Central Provinces is that no Registrar has held office for more than two years. They have been changing, and so they have not been able to put in as much work as they could have if they had been fixed to the department. They come to the department, work there for a couple of years, and then go to some other department.

33343. On page 538 you say: "Indians by temperament are not such dirty people as they are represented to be". Who has been representing them to be dirty?—That is the general impression.

33344. I should have thought that, in some respects, the houses of the cultivators in the average village are extraordinarily clean; and that it is just the absence of knowledge as to facts of infection which, in certain essential matters, leads them to practices which are responsible for the spread of epidemic diseases?—They are quite careful about infectious diseases.

33345. You think they are?—Yes. If a man is suffering from small-pox, nobody is allowed to enter the hut of that man. They keep fire burning throughout, and when the man has recovered they clean the house again. In cases of epidemics like plague, they at once leave their huts.

33346. *Prof. Gangulee:* What about the surroundings of the houses?—They are dirty.

33347. *The Chairman:* Take the case of cholera: where is the linen soiled by a cholera patient usually washed?—It is washed in the village tank.

33348. On page 539 you say: "we find that, on an average, debt per head has been increasing from year to year." Could we have the facts on which you base that view?—The fact is that if you take the Co-operative Report of this Province you will find that the average debt per head has been increased in almost all the cases.

33349. Have you made any definite survey of any particular district? These impressions are very misleading?—If you take the sums which are under award in liquidation cases, then you will find that the amount has been increasing from year to year.

33350. You think that necessarily means that the total debt over the whole country is increasing?—That is one aspect. If you take the average debt per head, you will find that that also has been increasing.

33351. How do you know what the average debt is?—I know because I am connected with the bank.

33352. *Prof. Gangulee:* You have not undertaken any enquiry on which you base this statement?—I base it on whatever inquiry I have made. As a matter of fact, no regular enquiry has been made by Government itself.

33353. *The Chairman:* I want to be sure that I have not misunderstood you in this matter of *taccavi* loans in relation to co-operative societies. Was it your suggestion that primary societies should administer these *taccavi* loans?—Not primary societies; Central Banks. It would be too much for the primary society to take it up. The Central Bank can take the loan from Government; and guarantee the rate of interest, and its repayment.

33354. So that there will be no competition between *taccavi* loans and Central Banks?—No. I do not want competition.

33355. *Sir James MacKenna:* Are you the owner of the estates you were talking about?—Yes. I am the legal owner.

33356. Have you had much assistance from the Agricultural Department?—Yes, they have given me much assistance.

33357. They have given you considerable assistance?—Yes, that is due to the fact that we have been asking the help of the department from the very beginning.

33358. Are you a member of the Legislative Council now?—Yes.

33359. Have you been a member since the beginning?—Yes.

33360. Do you remember the year in which there was a cut of Rs. 2 lakhs in the agricultural budget?—Yes.

33361. Were you in favour of that cut?—Yes.

33362. Why?—Because Government had produced that year the Report of the Co-operation Committee, and that report was so reactionary that we were bound to vote against it.

33363. What do you mean by co-operation? Political co-operation?—I am using the expression strictly in the co-operative sense. The Local Government had appointed a committee to examine the working of the Co-operative Department.

33364. And because that did not satisfy you, you cut the agricultural budget?—The idea was to cut the Co-operative Department budget, not the agricultural budget.

33365. But the axe fell on the wrong branch?—That may be.

33366. *Prof. Gangulee:* What do you mean by reactionary?—It was a reactionary report. The present position in the Province is that when Central Banks have their own Chairmen, the district officials have got nothing to do with them. The report recommended that the Registrar, whenever he finds that suitable non-officials are not coming forward, should be given the power to appoint anybody as Chairman of any Central Bank. Then, it gave power to the Registrar to turn out any member of a co-operative society or any director from any bank. These were the proposals which we were bound to resent.

33367. You did not approve of them?—No.

33368. *Sir James MacKenna:* What reason have you for saying on page 530 that: "Before the introduction of the Reforms scheme, the Agricultural and Veterinary Services were not in touch with the rural population but now it has changed and therefore the work of these services is being more appreciated"?—The view current up to 1920 was that the department was mainly concerned in carrying out research work at headquarters. But in 1921, when the non-official side said that it was desirable that they should familiarise the people with their researches, they took to field work also.

33369. They did not do it before 1920?—Not in the way they have been doing since then, and public criticism is responsible for it.

33370. You think that it justifies your making that statement?—Yes.

33371. Are you not aware of the introduction of *roseum* cotton and the transplantation of paddy in Chhattisgarh, before the Reforms? Can you quote anything that has been done since the Reforms?—As a matter of fact, this transplantation was not a new thing propagated by the department; the people knew about it, and it was done before that in the United Provinces. As regards *roseum* cotton, I think that the department has concentrated too much on *roseum* cotton. The position here is that there are five Divisions in the Central Provinces; Berar and Nagpur are cotton tracts, Chhattisgarh is the paddy tract and the Jubbulpore and Nerbudda Divisions are wheat tracts. They might have been doing a lot already in one Division, but the other Divisions were suffering.

33372. Are they not doing anything in the wheat tract?—Now they are doing much.

33373. They did not do a great deal before 1920?—Not much.

33374. *Prof. Gangulee:* Who evolved the A-115 type of wheat? Of whose work is it the result?—I do not know. What I wanted to say was that the people should be made familiar with the researches of the department.

33375. Have any demonstration farms been started since the Reforms?—They existed even in 1920.

33376. Do you know of any farm that has been started since the Reforms?—There are two farms in my own tahsil.

33377. Started since 1920?—Yes.

33378. You show a great deal of interest in the development of agriculture; are you familiar with the practice in the Agricultural Institute in Nagpur or in various Government farms?—I have tried to keep myself in touch with them.

33379. In what way have you kept in touch?—I am a member of the Provincial Board of Agriculture.

33380. Do you attend the Board meetings regularly?—Yes, regularly.

33381. When did you attend last?—I think the last meeting was held in September.

33382. Did you at any time place before them the views that you have placed before us?—Yes, I have moved resolutions; I pressed for these things; I have pressed for the contract ploughing system; I have pressed for seed supply business.

33383. You suggest various legislative measures for the benefit of agriculturists. Did you as a member of the Legislative Council take any steps in that direction?—As far as the Legislative Council is concerned, it has been working in a very haphazard manner.

33384. What do you mean by that?—As a matter of fact, in the last three years nothing has been done; during 1920, 1921 and 1923 when the Legislative Council were working there were two Ministers; but after the Swarajists entered the Council the Ministers disappeared and along with the Ministers the Council also.

33385. But that should not interfere with your introducing any beneficial measures?—We could not do it, because the Government said that in the absence of Ministers they were not prepared to lay down any new policy.

33386. On page 530 you say that since the Reforms the work of these services is being more appreciated?—Yes.

33387. And on page 529 you say that the people have not much faith in the activities of the Agricultural Department?—Yes.

33388. Could you explain that a little further?—The position has considerably changed since 1920 but a great deal of work is still to be done.

33389. That we all realise, but you say the people have not much faith in the activities of the department. You yourself have introduced *roseum* cotton in your tahsil?—Yes.

33390. We have had evidence to the effect that cultivators are growing A-115 wheat and better implements have been introduced in various tracts?—Yes.

33391. Then why do you say the people have not much faith in the Agricultural Department?—You are putting too literal an interpretation on my words.

33392. So that you do not mean what you say here?—I do not mean to say that I condemn the department altogether.

33393. Then I will leave it at that. Is there a Federation of Co-operative Societies here?—Yes.

33394. Are you connected with it?—I am its Governor.

33395. How is that Federation working?—It did not put much work for the last two years, but now it is showing signs of life.

33396. Why did it not work during the last two years, and why is it showing signs of life now?—In 1921 the Governor of the Federation became a Minister of the Central Provinces Government. The gentleman who was then elected Governor in his place died within a month of his acceptance of office. After that nobody came forward to accept the responsibility because the office was an honorary one and entailed a great deal of work. The present position is that I have taken up the work, but I have no money with which to carry on any work.

33397. Did you say that that Federation is showing signs of life now?—Yes.

33398. Who gave life to the Federation?—The new Executive Council. A new Executive Council has been elected and I have been rendering some service in that direction.

33399. You have told us something about the primary society of which you have knowledge?—Yes.

33400. To what class does that particular society belong?—There are very few societies of "A" class; the majority of them are of "C" class.

33401. Does the society which you know belong to "C" class?—"C" and "D".

33402. Who does the auditing?—The Government Auditors.

33403. Are you satisfied with that arrangement?—Personlly I would suggest that more Auditors should be appointed, and that the Central Bank should not be asked to bear the expenses of the audit. What I suggest is that the Central Bank should confine its activities to education, training and propaganda.

33404. I understand you are also a member of the District Council?—I am Vice-Chairman of the District Council and Chairman of the Local Board.

33405. What are the chief interests of your Local Board?—We are concerned with roads, school buildings and pounds.

33406. Of the three things you have mentioned, roads, school buildings and pounds, which interests the Board as a corporate body most? Are you keen on better roads, better pounds, or better school buildings?—They care more for schools; they are not in a position to care for the roads because they have no money at their disposal.

33407. What about the Veterinary Service?—They do not have full control over the Veterinary Service.

33408. I think you are referring to *taccavi* loan when you say in your note that coercive processes are used to make recoveries?—Yes.

33409. What are the coercive processes to which you are referring?—You can attach a man's property and send him to prison at once.

33410. Is that what you mean?—Yes.

33411. On page 530 you refer to the Conciliation Board; what Board are you referring to?—These Boards were established once in the Central Provinces and they went from town to town; they sent for *sowcars* and moneylenders and got their debts compounded in many ways.

33412. Is that Board still functioning?—It functioned once.

33413. What has happened to it?—I cannot say; it may have been abolished.

33414. You are not in touch with it?—No; that was long ago; it was about fifteen years ago.

33415. On page 532 you make a statement which I do not quite follow: "Letters to all the Provincial Heads of the Agricultural Departments and to the Pusa Institute were sent by the Association but no one was able to give sound advice in this matter." Are you referring to a particular incident?—Yes.

33416. Would you explain what it is?—It was a problem like this: there being 60 inches of rainfall and about 40 degrees temperature in winter, the whole area being water-logged, they were asked what should be grown as fodder crop.

33417. *Mr. Calvert:* I gather you are a strong upholder of the independence of Central Banks?—Yes.

33418. And you resented the suggestion that the Registrar should have power to appoint a Chairman?—Yes.

33419. And you would not like the Collector to interfere with the working of the Central Banks?—No, I do not want him to interfere.

33420. You propose that *taccavi* should distributed through the Central Banks?—Yes.

33421. Would the Central Bank also be responsible for the collection of the *taccavi*?—Certainly.

33422. The Collector, as you know, has special powers for recovering *taccavi* loan?—Yes.

33423. But the Central Bank would not have those special powers?—Very well.

33424. How would you get over that difficulty?—It is not in every case that coercive processes are used.

33425. But part of the argument against the Government system of *taccavi* is that coercive processes are used?—Yes, but in the co-operative society minimum coercion would be used.

33426. But supposing the Central Bank could not collect certain *taccavi*?—Then the Central Bank would have to pay it out of its own funds.

33427. And bear the loss?—Yes.

33428. The Central Bank would not resort to any special powers?—No.

33429. You would not mind the Central Bank incurring the loss on sums found to be irrecoverable through its ordinary powers?—Quite so, but the Central Bank at the same time would be making some profits; if they are advancing, say, at Rs. 7-12-0 per cent to an ordinary cultivator, the Government can very well advance money, say, at 6 per cent to the Central Bank which would offer them much better security; I would give the difference between the two rates to the Central Bank.

33430. Under the Co-operative Societies Act Government dues due by societies may be recovered by a special procedure?—Yes.

33431. Therefore it would be possible for the Central Bank to get this special procedure enforced to recover *taccavi* lent through it; would you not allow a Central Bank to use those powers?—No; as a matter of fact, such powers have not been much used in the Province.

33432. But you have in the Province the procedure under the Public Demands Recovery Act?—Yes.

33433. That is frequently used?—Yes.

33434. But you would not use those powers to collect arrears of *taccavi*?—I would use those powers; when we are going to incur responsibility we should use such powers as we have under the Co-operative Societies Act already; it would be extremely unfair that we should be deprived of the powers which we already have under the Act.

33435. So that you would use those special powers?—Yes.

33436. Which depend upon the Registrar or the Collector intervening?—Yes.

33437. Even though you do not like the Collector intervening in the affairs of the Central Banks, you would like him to intervene to collect the dues which you cannot collect?—The only thing is this: we require his help only when we have failed in all other ways. The complaint against *taccavi* loans and the loans under the Government Land Improvement Acts is that in 1923-24 and 1924-25, when there was a financial deficit in the Province, Government issued instructions to the Revenue Officers to collect these loans, and in realising those loans the Government authorities became very strict. The result of all that is that nobody wants to take loans from the Government.

33438. In the recovery of arrears due to societies, do you not believe in strictness?—What do you mean by strictness?

33439. Do you not think a member of a primary society should be made to pay what he can pay?—I think they do as long as they can.

33440. Is that strictness in recovery a prime element in the success of all co-operative societies?—There is not much strictness, and then you cannot substitute coercion for co-operation.

33441. Just to clear that up: at first you give us the impression that the Central Bank should face loss rather than take coercive measures. What is the exact idea intended to be conveyed by the expression "coercive measure"? Do you mean those measures which we can already take under the Co-operative

Societies Act?—I was referring to the actual powers conferred by the Co-operative Societies Act to collect dues to the Government.

33442. When exactly would you stop incurring the loss and when would you begin to apply to the Collector for these coercive powers?—When we find that all our efforts have failed; it would be the last resort.

33443. The point is that your distribution of *taccavi* through the Central Banks would tend to involve you in interference from the Collector?—Why should he interfere; when it is required he should come forward and give it on the security of the Central Bank. Secondly, it saves the Collector also a great deal of bother: he has to hold an enquiry into the whole thing, as to whether the man is sound, whether he can pay, what is his paying capacity and so on. He would be saved from that bother. When we are going to save him that bother, when we are giving very good security to Government, why should Government grudge advancing loans through the Central Banks?

33444. I suppose you know that even under the present system of *taccavi* being distributed through Collectors, considerable sums have to be remitted as irrecoverable?—Yes.

33445. So that your Central Banks would suffer loss?—Why should we suffer loss?

33446. If the Collector cannot recover by special procedure, it is not likely that you would be able to recover without that special procedure?—Yes, but we should not suffer loss because we are taking the difference between the two rates.

33447. *The Chairman:* As profits for the Central Bank?—Yes.

33448. *Mr. Calvert:* You would be prepared to regard that profit as covering your losses?—If things come to that, we are bound to suffer loss.

33449. In discussing indebtedness you refer to previous loans which have not been cleared off for generations?—Yes.

33450. That is to say, there are people who are born in debt, live in debt and die in debt?—Yes.

33451. Would you, in order to get rid of that, advocate a more free use of insolvency?—I would not object to their becoming insolvent.

33452. You would not object to a resort to insolvency to get rid of inherited debt?—As a matter of fact the cultivator tries to pay as long as he can; he is not essentially dishonest; he becomes dishonest only when he finds that all other methods have failed.

33453. He even goes on paying off debts which are really time-barred?—That he does.

33454. Till the only resort is insolvency?—Yes; it is the last resource when the creditors begin to harass him.

33455. But I gathered from your reply to the Chairman that you expressed a view rather opposed to the insolvency proceedings; I could not quite understand the point?—For that I must take you to Bombay where you opposed the suggestion that the Central Provinces had brought forward for amending the Insolvency Act. The suggestion was thrown out at your instance and at the instance of Mr. Madan. Now I think you are in favour of it. I will give you a concrete instance. There is a man at Hoshangabad who has got 3,000 acres of occupancy land and who has become insolvent. Now the position is that while the man is getting money from his tenants by sub-leasing his plots, he is not paying a single rupee to his creditors. I will give you another instance. The Piparia Central Bank is suffering from a loss of Rs. 40,000 which were advanced to persons who had occupancy rights but who have got themselves declared insolvent.

33456. Cannot the rents be attached?—No; they pay rent so far as the Government land is concerned; Government has got the first preference over the land; land revenue must be paid.

33457. I still do not quite understand you; are you in favour of an extension of insolvency proceedings or a curtailment?—I should say that loans to the co-operative societies should come under exceptions, just as Government dues. That is my point. I would not allow the man to surrender his holding to the malguzar or dispose of it in any other way as long as there are debts against him

in favour of the co-operative society. The present position is, suppose I am a member of the co-operative society and I have taken a loan and get myself declared insolvent; you can attach my crop, but I do not cultivate the land myself and so you cannot attach my crop; I sub-lease my holdings. The second difficulty is that if he surrenders his holding to the malguzar, the latter gets the holding for nothing and does not pay anything to the co-operative society. The nature of the tenancy throughout the Central Provinces is like this and so long as the cultivator has got only occupancy rights he possesses no assets, and when he possesses no assets his credit ought to be *nil*.

33458. *Prof. Gangulee:* What are your suggestions?—Nobody can now get himself declared insolvent as long as he has not paid off Government loans; if the man has taken a Government loan, Government can at once take possession of his occupancy holding and auction it off; but that cannot be done in the case of the co-operative societies.

33459. *Mr. Calevrt:* You want the loan to the co-operative society to be a first charge on his assets on a par with the land revenue and the rent?—Yes; you may give me the second place; I shall be quite content.

33460. Revenue first, then rent and then a loan due to the co-operative society?—Yes; I will be satisfied if I get that.

33461. That is the present Bombay Act?—Yes; I will be satisfied with it.

33462. Apparently, people who breed bullocks now are able to get Rs. 150 for a pair, whereas formerly they only received Rs. 60; has that encouraged bullock breeding at all?—So far as breeding farms are concerned, I think they are not paying. I maintain one myself which is certified by the department, but I find that it does not pay.

33463. *Prof. Gangulee:* What breed do you have?—The Malvi breed.

33464. *Mr. Calvert:* Is there any very marked difference between the districts of Hoshangabad and your own in regard to fodder and pasture?—There is a great deal of difference, as much difference as there is between Nagpur and Chhattisgarh.

33465. Which is better situated as regards pasture and fodder?—I think Nagpur is better situated.

33466. As between Hoshangabad and Jubbulpore?—Jubbulpore is the worst because the system of cultivation there is entirely different from what prevails here in Hoshangabad. Here you do not have water-logged areas, whereas throughout the Jubbulpore district there is that system.

33467. But comparing Jubbulpore and Hoshangabad, which has more pasture?—That I cannot say; but pasture is bound to be greater here because there is not so much rainfall here and it is free of water-logged areas. Then again, this tract produces cotton and *juar* and they serve as fodder; these crops are not grown in Jubbulpore.

33468. The District Agricultural Association of Hoshangabad say that the common village pastures are over-stocked and your Agricultural Association say that there is very little over-stocking of common pasture?—I think both of them are mistaken. What is meant by over-stocking? Do the Hoshangabad people mean to say that they have got more agricultural cattle than what are actually required for cultivation?

33469. *The Chairman:* Is not the ordinary interpretation of the word over-stocking that there are more animals living on the land than the land is capable of feeding?—That may be; that is a matter for the Hoshangabad people to say.

33470. *Mr. Calvert:* In your district there is ample pasture for the cattle?—No.

33471. You say there is no over-stocking of common pasture, which means there is ample pasture for cattle?—By over-stocking what I meant was the maintaining of more cattle than were necessary for our agricultural purposes; we have used the word with that idea.

33472. Have you or have you not, ample pasture for cattle?—We have not.

33473. Discussing labour, you refer to the weak physique due to malnutrition. Do you find that among the *atta*-eating people or the rice-eating people?—You will find that when you compare the people from the Punjab and the United Provinces with the people from the Central Provinces, and you will find a still

greater difference when you compare the people of Chhattisgarh with the people of the Jubbulpore Division. You will find that those people who come from the wheat-producing districts are generally more hardy.

33474. Is this malnutrition due to diet or due to poverty?—I think it is due to both.

33475. Actually the rice diet is more expensive than the wheat diet?—It may be; I cannot say anything about it.

33476. You seem to think that Government could bring about a doubling of the population in twenty years by paying more attention to sanitation. Would you regard that as a good or as an evil?—If it is evil to have a family, then that is also an evil.

33477. Would you look upon doubling the population in twenty years as a thing to be desired?—I would; and if it does not double itself there must be something wrong somewhere in the system.

33478. The reason why I ask you is that you are rather opposed to people earning higher wages by industries?—My position is not that; what I say is that the business of agriculture should be made so paying that they will be able to find work in their own villages.

33479. You have studied the Punjab system of co-operation?—No; I had never been to the Punjab.

33480. You suggest that local bodies should be allowed to appoint organisers; would you not rather have them appoint educators in co-operation?—Yes.

33481. You say credit societies require more attention. Do you not think education is more important than organisation?—You may give them that work also. I have no objection.

33482. You think the settlement policy of the Government discourages owners from carrying out improvements. Can you give us any instances where owners actually have not carried out improvements for fear of an increase in the settlement rate?—Yes. The settlement of the Jubbulpore district is likely to take place in 1928. Now if I had fallow land I should keep it fallow, otherwise in the settlement the land revenue might be increased.

33483. Are you actually at this moment keeping the land fallow in order to avoid enhancement of revenue?—Not only I, but a number of other people are doing the same.

33484. You are actually doing it?—Yes.

33485. *Sir Ganga Ram:* In another connection you told us that you passed in law and took to agriculture; is that so?—What I said was that I am an LL.B., but I have never practised law.

33486. You have taken to agriculture? Is that from a moral point of view or from a lucrative point of view?—It is neither from a moral nor from a lucrative point of view.

33487. Then what has guided your judgment in the matter so as to divert you to agriculture and not to law? Is agriculture more paying than law?—It is not like that. My father-in-law, who was a big landowner in the Jubbulpore district, died in January 1921 and I had taken my LL.B. degree in 1920.

33488. He left you all that property?—Yes; and I came and took up the management of his estate so that I had no time to devote my attention to law.

33489. And you are an M. L. C. now?—Yes.

33490. And may I ask you to what party you belong?—I am an Independent.

33491. Is your estate close to that of the gentleman who preceded you as witness?—There must be a distance of at least 50 miles between them.

33492. All I want to know is whether you have any idea as to how irrigation may be brought to your estate?—I have got one irrigation tank in my tahsil.

33493. Do you feel the want of any more irrigation?—It is only in that tract that irrigation can be successful. The rest of the land has got huge cracks where irrigation cannot be of any benefit.

33494. You said your wheat outturn was four times the amount of the seed? How much seed per acre do you sow?—We sow about 100 lbs. per acre.

33495. You never take the advice of the Agricultural Department as to how much seed you should put in?—They suggest 10 *kuros* which amounts to about 100 lbs. per acre.

33496. Is that their suggestion?—Yes.

33497. Do you not *bund* up the rainfall water so as to prevent its flowing away?—The whole of our land is water-logged and in the rains we have sheets and sheets of water, extending for miles around.

33498. You said, I think, in one place that Government should not discourage *Brahmini* bulls, in other words *Brahmini* bulls should be allowed to spread all over the country?—Yes.

33499. That was the old method of breeding, and you consider it the best method?—There are better methods. I want to put one bullock in a group of 25 villages, but that is not a practical proposition. Funds are not available for the purpose.

33500. *Sir Thomas Middleton:* You point out the deplorable condition of livestock in your area and make a number of suggestions for improving them; one is that the Government forests should be opened? What is the present charge for grazing?—I do not remember.

33501. The last witness told us it was from 4 to 8 annas?—That may be so.

33502. Do you think if the Government forests were opened and made free that would make much of a difference?—I would not say that grazing should be made free, but I think that a minimum rate should be charged. The point is this, that if you have a forest area sometimes in the neighbourhood of villages which are densely populated, their pasture land is taken by the Forest Department. In that case what are the people to do?

33503. Villagers can get grazing for their cattle at 4 annas or 8 annas per head?—No, the villager provides grass for himself at that rate. So far as the villagers are concerned, they cannot provide anything.

33504. Could their landlords not provide it for them?—Their landlord has to pay even for the pasture land to the Government.

33505. Why not? Why should Government not charge?—If you say that I should leave the pasture land free to my cultivators it is only fair on my part to ask you to keep the land revenue free. You do want us to give concession to our tenants while you are not prepared to extend any to us.

33506. I have not asked you to give pasture land free?—As a matter of fact some pasture land is given free by the malguzars. They give, I think, free pasture for one pair of bullocks to every 10 acres, and then again the majority of the landowners do not charge anything for the grazing of cows.

33507. You have a thousand acres under your own management? How much pasture land have you got on that thousand acres?—I have set apart one of my forest villages.

33508. *Sir Thomas Middleton:* It is part of the 9,000 acres?—Yes.

33509. You set that apart and you charge nothing for the grazing from the cultivators?—No; they have got that right only in the vilage in which they reside. They cannot assert that right in my other villages.

33510. So that you act very much as the Government does?—Yes.

33511. *Sir Henry Lawrence:* What rates do you charge for your grazing?—If a tenant has got 10 acres, I give him grazing free for one pair of bullocks.

33512. For the others what do you charge?—From 2 annas to 12 annas per year. And then I have other advantages; I may utilise their cowdung and other things. That is a most important thing.

33513. *Sir Ganga Ram:* You get milk free from them?—Not at all.

33514. *Prof. Gangulee:* Do you give the cultivator a receipt for the amount he pays you?—If he wants it, I give it to him.

33515. Does this note which you have presented to us represent your own views or the views of your Association?—There is not much difference between the Association and myself.

33516. This note was not presented before your Association?—Yes, it was presented and discussed with its leading members.

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33517. *Dr. Hyder:* You are a malguzar?—Yes.

33518. And you carry on this business of agriculture in order to make a living?—Certainly.

33519. You are against the export of fodder from the Central Provinces to the United Provinces?—Yes.

33520. Would you be against the export of wheat which you raise to the United Provinces or to any other tract?—No.

33521. You would not be against the export of wheat because that would bring down the prices and you might find yourself in a desperate position? Why is it then that you are against the export of fodder?—Because it takes away the capital which I have got.

33522. What capital?—If my cattle die early or if they are in a weak state of health owing to shortage of fodder that means that you are taking away so much from the capital itself.

33523. Let us pursue this matter further because you have mixed up a number of matters. The United Provinces people do not force away the fodder from you because they pay you a higher price. Suppose you did that, your fodder would not leave your estate? Why are you against the export of fodder when you are not against the export of wheat? Do you not see any inconsistency there?—No, food material which is absolutely necessary should not be exported, even if the general policy of Government be one of free trade.

33524. Supposing the Government prohibited the export of wheat or cotton, would you favour that measure?—No.

33525. Then why do you favour this measure with regard to the export of fodder?—Because a minimum should be allowed to remain here.

33526. Take the question of cattle? You say that more and more land is being taken up for cultivation and that there is a diminution in the area available for pasture? If that is so, how are you going to keep the balance even between your cattle and your people?—I have said that it is desirable that some sort of legislation should be undertaken to stop the encroachment on pasture land.

33527. Suppose that were done and suppose your suggestion were followed that there should be no diminution in the number of cattle, would there not be a tendency for the cattle to increase?—Yes.

33528. Do you not think that the time would come when your cattle would eat up your children? I put it to you that the peasant's children may be crying out for wheat or rice and the wheat and rice may not be there but your fodder for your cattle may be there? Do you see that?—If you have to carry on cultivation you must have a certain number of bullocks and if you keep a certain number of bullocks you must provide fodder also for them.

33529. But couple it with your suggestion that there should be no other use of cattle but for agricultural purposes? If you put no limits on the cattle population, the bread would be taken away from the children of the peasant and you might find yourself in a predicament?—If that sort of a situation were to arise I am sure that we should get another Commission without much delay.

33530. Take another matter. I only mention this because you have referred to other countries. Do you know what the taxation on land is in other countries? Have you any idea? Do you know that they fix a levy on land in other countries?—Yes. What I meant to say was this that in no country does the land revenue form such a large proportion of the total receipts from all sources as it does in India. That was my idea when I wrote that, and I still adhere to that opinion.

33531. Does that mean that the land revenue sits very heavily on the gross or on the net produce?—I think we are paying more. Take England, for instance, where you have to pay 60 shillings for an acre of land; their wheat outturn is something like 2,000 lbs. per acre, while the best we can get in the Central Provinces is 600 lbs.

33532. You know that the English landlord is subject to a certain schedule and he has got to pay income-tax. Do you know that he has got to pay the local rates? Do you pay any income-tax?—No.

33533. Do you know that in Italy the land is subject to a basic rate of 10 per cent; then there is local taxation, communal taxation, and the State taxation?—But what is the average yield per acre there?

We are concerned here with the net profits on which the assessment of land revenue is made.

33534. I pass on to another matter. Do you have many wells on your estate?—Yes.

33535. Do you charge your cultivators for the use of those wells?—No.

33536. Why do you ask the State then to keep its water rate rigid?—Because the development and prosperity of 90 per cent of the people means something to the State. The State would be nowhere if 90 per cent of the people were to disappear.

33537. To revert to this question of taxation, you charge *nazarana*?—Yes.

33538. Do you not capitalise all the future increments in this *nezarana*, thing for giving him the right.

33539. Do you not capatilise all the future increments in this *nazarana*, and leave the State with nothing to tax?—So far as *nazarana* is concerned, you can get very good *nazarana* where there is income from other non-agricultural sources, but in hilly tracts and thinly populated places you have to lease the land as best you can.

33540. Where the land is irrigated and well populated, the malguzars take away whatever the peasant produces and leave the peasant destitute and the State bankrupt. Would that be an exaggeration?—It is certainly an exaggeration so far as this Province is concerned. We have not got that acute problem of tenancy which they have in the United Provinces.

33541. *Sir Henry Lawrence:* I understand you have studied the financial position of the Province?—Yes.

33542. And you wish to have more expenditure on agriculture?—Quite so.

33543. And more expenditure on sanitation?—Yes; as a matter of fact, more expenditure on rural areas. That is the correct position to take up.

33544. You want more expenditure in the way of subsidies to coal mines?—I am not concerned with coal mines. I should be very glad if I get some subsidy for the agricultural classes.

33545. You have suggested that a subsidy should be paid to coal mines?—What I have suggested is that while Government are taking so much interest in industries, they should give assistance to agricultural industry also.

33546. You say, "If such mines can be worked even on getting subsidies from Government, they should be encouraged to start work". Does it not mean subsidies? Where is this money to come from?—From those very sources which gave Rs. 50 lakhs to the Tata Iron and Steel Co.

33547. Does the money not come from the people?—It has already come in some cases.

33548. You want to abolish the salt tax?—That I would.

33549. Are you in favour of the prohibition of alcohol?—Everybody should be in favour of it.

33550. You are prepared to face a loss of Rs. 160 lakhs from alcohol in the provincial revenue?—There is no justification for carrying on this traffic in vice.

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(The witness withdrew.)

The Commission then adjourned till Monday, the 31st January, 1927, at Lucknow.

MR. K. P. PANDE.

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PETERSON, H. H., B.A., Secretary, Y.M.C.A., and President, The Empress Mills Co-operative Stores, Ltd., Nagpur : (442-446), 32,555-32,424.

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GLOSSARY.

ACHAR ... ... Fodder (leaves, pods, shoots) obtained from the *babul* tree (*acacia arabica*).
ADAT ... ... Brokerage, commission.
ADHIA ... ... Division of produce between two parties in equal proportions.
ADTYA (ADATYA, ADATIYA.) An agent or broker.
AKOLA (hoe) ... ... A tined intercultivating implement.
ANNA ... ... One sixteenth of a rupee; equivalent to $1\frac{1}{8}$d. at exchange rate of one and sixpence to the rupee.
ATTA ... ... Wheat flour.

BABUL ... ... A widely distributed small tree (*acacia arabica*).
BAKHAR (BAKKHAR, VAKHAR). A blade harrow used as a substitute for the plough and also for preparing the seed bed.
BALAJEE ... ... Lit. name of a diety. A religious cess.
BALUTA ... ... A village servant.
BAN ... ... A wood, grove.
BANDI ... ... A field of grain which has failed to mature.
BANDHI ... ... A rice field.
BANIA ... ... A Hindu trader who is generally also a money lender.
BANJARA ... ... A tribe of itinerant grain and cattle merchants.
BARANI ... ... Unirrigated land depending on rain for its water supply.
BAREE ... ... A caste of vegetable gardeners.
BARHI ... ... Interest in kind upon seed-grain.
BASTI ... ... A village, any inhabited place.
BATAI ... ... Payment of rent in kind, by division of produce between landlord and tenant.
BERA ... ... An inclosure.
BERSEEM ... ... Egyptian clover (*trifolium alexandrinum*).
BHATA ... ... Light, red, laterite soil.
BHUSA ... ... The husk or chaff of grain; the straw.
BIASI ... ... Cross-ploughing of rice land after the crop has come up.
BIDI ... ... Country-made cigarette.
BIGHA ... ... A measure of land; the standard or *pucca bigha* is 3,025 square yards, or $\frac{5}{8}$th of an acre.
BIR ... ... An area reserved for the growing of grass.
BOJA ... ... A bag of unpressed cotton, weighing 392 lbs.
BUND ... ... A dam, a field embankment.
BURAD ... ... The name of a Hindu caste whose main occupation is mat-making.
BURI ... ... A variety of cotton imported from America (*gossypium hirsutum*).

CASSAVA ... ... Tapioca (*manihot utilissima*).
CHAK ... ... A block or portion of land.
CHAKBANDI ... ... Consolidation (of holdings).
CHAMAR ... ... A worker in skins. One of the depressed castes.
CHARAS ... ... The narcotic resinous exudation of the hemp plant, (*cannabis sativa*).
CHARKA (CHAKRA) ... Spinning wheel.
CHAUKI ... ... A post where a watch or guard is stationed.
CHAUKIDAR ... ... A watchman.
CHAWADI ... ... A shelter house for travellers.
CHOLIKHAN ... ... Cloth from which the bodice worn by females is made.
CHUNI ... ... Coarsely ground pulse.
CRORE ... ... Ten millions.

DAK (bungalow) ... A rest house for travellers.
DAL ... ... A generic term applied to various pulses.
DALAL ... ... An agent or broker.
DAMDOPAT ... ... An ancient Hindu provision by which the total interest on a loan may not exceed the amount of the principal.
DAWAKHANA ... ... A dispensary.
DAWRA... ... ... An intercultivating implement.
DERHI ... ... 1½ times; interest at the rate of 50 per cent.
DESHI ... ... Native to the country; indigenous.
DHAINCHA ... ... A leguminous fibre plant often grown for green manuring (*sesbania aculeata*).
DHAN ... ... The rice plant; unhusked rice.
DHANA ... ... Grain in general.
DHARMADA ... ... A contribution for charitable purposes.
DHIMAR ... ... A caste of fishermen.
DHORNE ... ... A cess devoted to cattle protection.

ERANDI ... ... Castor seed (*ricinus communis*).

FALTU ... ... Extra, unnecessary.

GANJ ... ... A market.
GANJA ... ... A narcotic derived from the unfertilized flowers of *cannabis sativa*.
GAOLO ... ... *See* GOWALA.
GAURAKSHAN ... ... A refuge home for cattle.
GHI ... ... Clarified butter.
GOND ... ... An aboriginal hill tribe inhabiting the eastern branches of the Vindhya mountains.
GOSHALA ... ... Charity devoted to cow protection.
GOWALA (GAOLO, GWARI, GOWLI.) ... A herdsman or milkman.
GRAM ... ... Cluck pea (*cicer arietinum*).
GUAVA... ... ... A small evergreen tree (*psidium guyava*) grown solely for its fruit.
GUR ... ... Unrefined Indian sugar, jaggery.
GWARI ... ... *See* GOWALA.

HAISSYAT ... ... A statement of assets and liabilities.
HAKIM... ... ... A practitioner of one of the Indian systems of medicine.
HAMALI ... ... Porterage charges.
HANGAM ... ... Time, season.
HARRA ... ... The black myrobalan (*terminalia chebula*).
HAQ ... ... A privilege, perquisite, right.

JAMADAR ... ... An official in the Agricultural Department subordinate to the Agricultural Assistant.
JARI ... ... A mixture of varieties of cotton belonging principally to the *gossypium neglectum* group.
JAT (plough) ... ... A light inversion plough.
JUAR (JOWAR)... ... The large millet (*sorghum vulgare*).

KABULI ... ... An agreement.
KALAR ... ... Saline efflorescence.
KAMDAR ... ... Fieldman; the lowest grade of official in the Agricultural Department.
KANS ... ... A coarse, deep-rooted grass weed (*saccharum spontaneum*).
KAPAS ... ... Cotton with the seed still adhering, (unginned).
KARANJA ... ... An evergreen jungle tree (*pomgamia glabra*).
KARBI (KADBI) ... Straw of *juar* (millet).
KARGA ... ... Wild rice.
KAYASTH ... ... A caste whose main occupation is that of writer or accountant.
KHADI RUMAL ... A handkerchief (*rumal*), the fabric of which (*khadi*) is made from homespun yarn.

KHALSA ... ... Lands or villages held immediately of Government.
KHANDI ... ... A measure of weight and capacity which varies according to the commodity and, in many cases, for the same commodity in different localities; for cotton, 784 lb.; at page 115, 180 lb.; a common grain measure is 200 seers or 411·4 lb. nominal weight.
KHAR ... ... A block of land, the soil of which is more or less homogeneous.
KHARI ... ... A hardy variety of sugarcane popularised by the Agricultural Department.
KHARIF ... ... The autumn harvest; crops sown at the beginning of the rains and reaped in October-December.
KHATA ... ... An account.
KHUDKASHT ... ... From *khud* (self) and *kasht* (cultivation); land cultivated by the proprietor, i.e., part of the home farm. (Any person who is allowed to cultivate it can acquire occupancy rights.)
KISAN ... ... A cultivator.
KORKU ... ... An aboriginal hill tribe.
KOTWAL ... ... A police officer.
KUNBI ... ... An agricultural caste.
KURO (KURU) ... ... A grain measure equivalent to 10 *seers*.
KUSUM(B) ... ... A forest tree (*schleichera trijuga*).
KUTCHA ... ... Inferior or bad [lit. "not solid"].

LAKH ... ... One hundred thousand.
LAKHABHATA ... ... Signifies the system of fragmented holdings; an ancient device, now obsolete, whereby the fields of a village were subject to periodical re-distribution, so as to ensure that each cultivator had a fair share of the different qualities of land.
LAKHORI ... ... The chickling vetch (*lathyrus sativus*).
LUGDA ... ... A strip of cloth worn as a petticoat.

MACHOWA ... ... The practice of sowing artificially germinated seed.
MAHAJAN ... ... Merchant, creditor.
MAHAL ... ... A district or province.
MAHAR ... ... A low caste, generally village servants.
MALEE (MALI) ... A gardener.
MALGUZAR ... ... Lit. revenue payer. A term applied to a proprietor or co-sharer in a village held in ordinary proprietary tenure.
MALIK MAKBUSA ... *Malik*, owner, proprietor; *makbuza*, occupied. A cultivator possessing a hereditary or proprietary right in the land he cultivates.
MANGO ... ... An evergreen fruit tree (*mangifera indica*).
MARWARI (MARWADI) A banker, broker, merchant.
MASUR ... ... Lentil (*lens esculenta*).
MAUND ... ... A weight of 82·28 lb. (*pucca maund*). Has different values for different commodities and for the same commodity in different localities.
MEGASS ... ... Residue of sugarcane after the juice has been expressed.
MEHRA ... ... A low caste, generally village servants.
MESTON, M.S.N. (plough) A very light type of inversion plough.
MILKAYAT SIRKAR ... Lit. Government property; plots of land of which the proprietor is the Government.
MOHARRIR (MUHAR) ... A clerk or writer.
MOHWA ... ... A deciduous forest tree (*bassia latifolia*) whose dried flowers are eaten as food or distilled into liquor.
MOTE ... ... A receptacle for hoisting water from a well.
MUNG ... ... Green gram (*phaseolus radiatus*).
MURUM ... ... Light stony soil.
MUSHAN ... ... A grass (*tseilma laxum*).
MYROBALAN ... ... Tanning fruit obtained from trees of the genus *Terminalia*.

NAHAN (mill) ... ... A 3-roller iron cane mill manufactured by the Nahan Co., Ambala.
NAKA ... ... A toll or custom station; a subordinate police-station.
NISTAR ... ... Release, acquittal.
NEWAR... ... ... A coarse cotton tape.
NULLAH ... ... A water course.

PADDY ... ... Rice (*oryza sativa*).
PAHADI ... ... Belonging to a hill tribe.
PAIDAWAR ... ... Pertaining to produce, outturn.
PAILI ... ... A grain measure; nominal weight in Nagpur is 1¼ *seer*.
PALAS ... ... A moderate-sized deciduous tree (*butea frondosa*).
PALLA ... ... Equivalent to three *maunds* or 120 *seers*.
PANCHAYAT (PANCHA) Lit. a committee of five. Used to describe an association of any number of persons, instituted for objects of an administrative or judicial nature.
PATEL ... ... The headman of a *ryotwari* village.
PATKA ... ... A silken girdle or sash.
PATWARI ... ... A village accountant or registrar.
PIE ... ... One-twelfth of an anna.
PINJRAPOLE ... ... A refuge home for cattle.
PONIA ... ... A grass (*tschoemum sulcatum*).
PUCCA ... ... Of good quality, up to standard, correct, substantial.
PURDAH ... A veil, screen; the practice of keeping women secluded.

RABI ... ... The spring harvest; crops sown in autumn and reaped at the end of the cold weather.
ROSEUM ... ... A coarse, short staple cotton (*gossypium neglectem roseum*).
RYOT ... ... A cultivator.
RYOTWARI ... ... A system of tenure under which the cultivator pays the revenue direct to Government.

SABUL ... ... An iron bar; *sabul* plough, a bar-pointed, inversion plough.
SALAI ... ... A gum tree (*brassica serrata*).
SANAD ... ... A charter, a certificate of honour.
SANN (SUNN) ... ... Bombay hemp; a leguminous fibre crop (*crotalaria juncea*); also used as a green manure.
SARBARAI ... ... Supply; means of providing for charges or expenses.
SARI ... ... A long cloth worn by Indian women.
SATNAMI ... ... A reformed sect of *Chamars*.
SATTA ... ... Traffic; exchange of money.
SAWAI ... ... An excess of one-fourth; interest at the rate of 25 per cent.
SEER ... ... A weight (2.057 lb.).
SEMAL ... ... A large deciduous tree (*bombax malabaricum*).
SESAMUM ... ... An oil seed (*til*) (*sesamum indicum*).
SHASTRA ... ... A scripture; a work of authority, especially one attributed to an inspired writer.
SHIKAR ... ... Hunting; *shikari*, a hunter.
SORGHUM ... ... A genus of grasses, the most important of which is *juar*, the great millet (*sorghum vulgare*).
SOWCAR (SOWKAR, SAHUKAR). A money lender.
SIHAR ... ... A light sandy soil.
SIR ... ... Home-farm land; the personal, family or private holding of a proprietor or co-sharer.
SIRKAR... ... ... The Government; the supreme authority.
SIRPANCH ... ... The chief of the *panch* (see *panchayat*).
SURKI (SARKI) ... Cotton seed.
TACCAVI ... ... An advance made by Government to cultivators for agricultural purposes.
TAHSIL... ... ... A local revenue division of a district.

TAHSILDAR	...	... A revenue officer in charge of a *tahsil*.
TALOOP	...	... A parasitic flowering plant (*striga lutea*).
TALUQ ...	...	... See *Tahsil*.
TALUQDAR	...	... A big landowner.
TAMASHA	...	... A show, spectacle.
TARWA ...	...	... A shrub (*cassia auriculata*).
TENDU ...	...	... A small tree (*diospyros tomentosa*).
TEORA ...	...	... Rape (*brassica campestris*).
TIL (TELLI)	...	... An oilseed (*sesamum indicum*).
TOLA ...	...	... The weight of a silver rupee; 80 *tolas* equal one *seer*.
TONGA ...	...	... A horse or bullock carriage.
TUR ...	...	... Pigeon pea (*cajanus indicus*).
URID ...	...	... A pulse (*phaseolus mungo*).
VADI ...	...	... An enclosed space.
VAIDAYA	...	... A practitioner of one of the Indian systems of medicine.
VAKHAR	...	... See *Bakkhar*.

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Royal Commission on Agriculture in India.

VOLUME VII.

Evidence taken in the United Provinces.

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ROYAL COMMISSION ON AGRICULTURE IN INDIA.

Seventh Interim Report of the Royal Commission on Agriculture in India.

June, 1927.

Presented to Parliament by Command of His Majesty.
August, 1927.

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INTERIM REPORT.

To

THE KING'S MOST EXCELLENT MAJESTY.

May It Please Your Majesty,

We, the Commissioners appointed to examine and report on the present conditions of agricultural and rural economy in British India, and to make recommendations for the improvement of agriculture and to promote the welfare and prosperity of the rural population; in particular, to investigate:—(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock; (*b*) the existing methods of transport and marketing of agricultural produce and stock; (*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists; (*d*) the main factors affecting rural prosperity and the welfare of the agricultural population; and to make recommendations; availing ourselves of Your Majesty's permission to report our proceedings from time to time, desire to submit to Your Majesty the minutes of the evidence which we have taken in respect of the United Provinces on the subject of our Inquiry.

All of which we most humbly submit for Your Majesty's most gracious consideration.

(Signed) LINLITHGOW,
Chairman.
(„) H. S. LAWRENCE.
(„) T. H. MIDDLETON.
(„) J. MACKENNA.
(„) H. CALVERT.
(„) N. GANGULEE.
(„) L. K. HYDER.
(„) B. S. KAMAT.

(Signed) J. A. MADAN,
(„) F. W. H. SMITH,
Joint Secretaries.

30*th June*, 1927.

(63589—22) Wt. 10916—658 625 8/27 H. St. G. 71

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TERMS OF REFERENCE

Generally,

To examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population;

In particular to investigate—

(*a*) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education, for the compilation of agricultural statistics, for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock;

(*b*) the existing methods of transport and marketing of agricultural produce and stock;

(*c*) the methods by which agricultural operations are financed and credit afforded to agriculturists;

(*d*) the main factors affecting rural prosperity and the welfare of the agricultural population;

and to make recommendations.

It will not be within the scope of the Commission's duties to make recommendations regarding the existing system of landownership and tenancy or of the assessment of land revenue and irrigation charges, or the existing division of functions between the Government of India and the local Governments. But the Commission shall be at liberty to suggest means whereby the activities of the Governments in India may best be co-ordinated and to indicate directions in which the Government of India may usefully supplement the activities of local Governments.

QUESTIONNAIRE

Part I

Question.

1. Research.
2. Agricultural education.
3. Demonstration and propaganda.
4. Administration.
5. Finance.
6. Agricultural indebtedness.
7. Fragmentation of holdings.

Part II

8. Irrigation.
9. Soils.
10. Fertilisers.
11. Crops.
12. Cultivation.
13. Crop protection.
14. Implements.

Part III

15. Veterinary.
16. Animal husbandry.

Part IV

17. Agricultural industries.
18. Agricultural labour.
19. Forests.
20. Marketing.
21. Tariffs and sea freights.
22. Co-operation.
23. General education.
24. Attracting capital.
25. Welfare of rural population.
26. Statistics.

QUESTIONNAIRE

PART I

1. Research.

(*a*) Have you suggestions to advance for the better organisation, administration and financing of—

(*i*) All research affecting the welfare of the agriculturist, including research into the scientific value of the indigenous theory and traditional methods of agriculture,

(*ii*) Veterinary research ?

(*b*) If in cases known to you progress is not being made because of the want of skilled workers, or field or laboratory facilities for study or by reason of any other handicaps, please give particulars. [Suggestions of a general kind should be made under (*a*) ; answers under this heading should relate to specific subjects. The purpose is to secure a list of the problems met with by scientific investigators in the course of their work which are being held over because of lack of resources or deficient organisation.]

(*c*) Can you suggest any particular subject for research not at present being investigated to which attention might usefully be turned ?

2. Agricultural Education.

With reference to any form of agricultural education of which you may have experience, please state your views on the following :—

(*i*) Is the supply of teachers and institutions sufficient ?

(*ii*) Is there an urgent need for extension of teaching facilities in any district or districts known to you personally ?

(*iii*) Should teachers in rural areas be drawn from the agricultural classes ?

(*iv*) Are the attendances at existing institutions as numerous as you would expect in present circumstances ; if not, state reasons. Can you suggest measures likely to stimulate the demand for instruction ?

(*v*) What are the main incentives which induce lads to study agriculture ?

(*vi*) Are pupils mainly drawn from the agricultural classes ?

(*vii*) Are there any modifications in existing courses of study which appear to be called for ; if so, what are they ?

(*viii*) What are your views upon (*a*) nature study ; (*b*) school plots ; (*c*) school farms ?

(*ix*) What are the careers of the majority of students who have studied agriculture ?

(*x*) How can agriculture be made attractive to middle class youths ?

(*xi*) Are there recent movements for improving the technical knowledge of students who have studied agriculture ?

(*xii*) How can adult education in rural tracts be popularised ?

(*xiii*) In suggesting any scheme for better educational facilities in rural areas, please give your views for (*a*) its administration and (*b*) its finance.

3. Demonstration and Propaganda.

(*a*) What are the measures which in your view have been successful in influencing and improving the practice of cultivators ?

(*b*) Can you make suggestions for increasing the effectiveness of field demonstrations ?

(*c*) Can you suggest methods whereby cultivators may be induced to adopt expert advice ?

(*d*) If you are aware of any striking instances of the success or the failure of demonstration and propaganda work, please give particulars and indicate the reasons for success or for failure.

4. Administration.

(*a*) Do you wish to suggest means towards the better co-ordination of the activities of the Governments in India or to indicate directions in which the Government of India may usefully supplement the activities of the local Governments ?

(*b*) Is it your opinion that the expert scientific knowledge required in the development of agriculture in the different Provinces could be supplied to a greater extent than is the case at present by increasing the scientific staff of the Government of India ? If so, indicate the types of work which would benefit by pooling the services of experts, and suggest how that work should be controlled.

(*c*) Are you satisfied from the agricultural standpoint with the services afforded by—

(*i*) The Agricultural and Veterinary Services,
(*ii*) Railways and steamers,
(*iii*) Roads,
(*iv*) Meteorological Department,
(*v*) Posts, and
(*vi*) Telegraphs, including wireless ?

If not, please indicate directions in which you think these Services might be improved or extended.

5. Finance.

(*a*) What are your views as to the steps that should be taken for the better financing of agricultural operations and for the provision of short and long-term credit to cultivators ?

(*b*) Do you wish to suggest means whereby cultivators may be induced to make fuller use of the Government system of *taccavi* ?

6. Agricultural Indebtedness.

(*a*) What in your opinion are :—

(*i*) the main causes of borrowing,
(*ii*) the sources of credit, and
(*iii*) the reasons preventing repayment.

(*b*) What measures in your opinion are necessary for lightening agriculture's burden of debt ? For example, should special measures be taken to deal with rural insolvency, to enforce the application of the Usurious Loans Act, or to facilitate the redemption of mortgages ?

(*c*) Should measures be taken to restrict or control the credit of cultivators such as limiting the right of mortgage and sale ? Should non-terminable mortgages be prohibited ?

7. Fragmentation of Holdings.

(*a*) Do you wish to suggest means for reducing the loss in agricultural efficiency attendant upon the excessive subdivision of holdings ?

(*b*) What are the obstacles in the way of consolidation and how can they be overcome ?

(*c*) Do you consider legislation to be necessary to deal with minors, widows with life interest, persons legally incapable, alienation and dissentients, and to keep disputes out of the courts ?

PART II

8. Irrigation.

(*a*) Name any district or districts in which you advocate the adoption of new irrigation schemes, or suggest extensions or improvements in the existing systems or methods of irrigation by—

(*i*) Perennial and non-perennial canals,
(*ii*) Tanks and ponds,
(*iii*) Wells.

What are the obstacles in your district or Province to the extension of irrigation by each of the above methods ?

(*b*) Are you satisfied with the existing methods of distributing canal water to cultivators ? Describe the methods that have been employed to prevent wastage of water by evaporation and by absorption in the soil. What form of outlet for distribution to cultivators at the tail end do you regard as the most equitable and economical ? Have these methods and devices been successful, or do you wish to suggest improvements ?

(*N.B.*—Irrigation charges are *not* within the terms of reference of the Commission, and should not be commented upon.)

9. Soils.

(*a*) Have you suggestions to make—

(*i*) for the improvement of soils, whether by drainage or other means, not dealt with under other headings in this questionnaire.
(*ii*) for the reclamation of Alkali (Usar) or other uncultivable land,
(*iii*) for the prevention of the erosion of the surface soil by flood water ?

(*b*) Can you give instances of soils known to you which, within your recollection, have—

(*i*) undergone marked improvement,
(*ii*) suffered marked deterioration ?

If so, please give full particulars.

(*c*) What measures should Government take to encourage the reclamation of areas of cultivable land which have gone out of cultivation?

10. Fertilisers.

(*a*) In your opinion, could greater use be profitably made of natural manures or artificial fertilisers? If so, please indicate the directions in which you think improvement possible.

(*b*) Can you suggest measures to prevent the fraudulent adulteration of fertilisers?

(*c*) What methods would you employ to popularise new and improved fertilisers?

(*d*) Mention any localities known to you in which a considerable increase in the use of manures has recently taken place.

(*e*) Has effect of manuring with phosphates, nitrates, sulphate of ammonia, and potash manures been sufficiently investigated? If so, what is the result of such investigation?

(*f*) What methods would you employ to discourage the practice of using cowdung as fuel?

11. Crops.

(*a*) Please give your views on—

(*i*) the improvement of existing crops,

(*ii*) the introduction of new crops including fodder crops,

(*iii*) the distribution of seeds,

(*iv*) the prevention of damage by wild animals.

(*b*) Can you suggest any heavy yielding food crops in replacement of the present crops?

(*c*) Any successful efforts in improving crops or substituting more profitable crops which have come under your own observation should be mentioned.

12. Cultivation.

Can you suggest improvements in—

(*i*) the existing system of tillage, or

(*ii*) the customary rotations or mixtures of the more important crops?

13. Crop Protection, Internal and External.

Please give your views on—

(*i*) The efficacy and sufficiency of existing measures for protection of crops from external infection, pests and diseases.

(*ii*) The desirability of adopting internal measures against infection.

14. Implements.

(*a*) Have you any suggestion for the improvement of existing, or the introduction of new, agricultural implements and machinery?

(*b*) What steps do you think may usefully be taken to hasten the adoption by the cultivator of improved implements?

(*c*) Are there any difficulties which manufacturers have to contend with in the production of agricultural implements or their distribution for sale throughout the country ? If so, can you suggest means by which these difficulties may be removed ?

PART III

15. Veterinary.

(*a*) Should the Civil Veterinary Department be under the Director of Agriculture or should it be independent ?

(*b*) (*i*) Are dispensaries under the control of Local (District) Boards ? Does this system work well ?

(*ii*) Is the need for expansion being adequately met ?

(*iii*) Would you advocate the transfer of control to Provincial authority ?

(*c*) (*i*) Do agriculturists make full use of the veterinary dispensaries ? If not, can you suggest improvements to remedy this ?

(*ii*) Is full use made of touring dispensaries ?

(*d*) What are the obstacles met with in dealing with contagious diseases ? Do you advocate legislation dealing with notification, segregation, disposal of diseased carcases, compulsory inoculation of contacts and prohibition of the movement of animals exposed to infection ? Failing legislation, can you suggest other means of improving existing conditions ?

(*e*) Is there any difficulty in securing sufficient serum to meet the demand ?

(*f*) What are the obstacles in the way of popularising preventive inoculation ? Is any fee charged, and, if so, does this act as a deterrent ?

(*g*) Do you consider that the provision of further facilities for research into animal disease is desirable ?

If so, do you advocate that such further facilities should take the form of—

(*i*) an extension of the Muktesar Institute, or

(*ii*) the setting up, or extension of, Provincial Veterinary Research Institutions ?

(*h*) Do you recommend that special investigations should be conducted by—

(*i*) officers of the Muktesar Institute, or

(*ii*) research officers in the Provinces ?

(*i*) Do you recommend the appointment of a Superior Veterinary Officer with the Government of India ? What advantages do you expect would result from such an appointment ?

16. Animal Husbandry.

(*a*) Do you wish to make suggestions for—

(*i*) improving the breeds of livestock,

(*ii*) the betterment of the dairying industry,

(*iii*) improving existing practice in animal husbandry ?

(*b*) Comment on the following as causes of injury to cattle in your district—

(*i*) Overstocking of common pastures,

(*ii*) Absence of enclosed pastures, such as grass borders in tilled fields,

(*iii*) Insufficiency of dry fodder such as the straw of cereals or the stems and leaves of pulses,

(*iv*) Absence of green fodders in dry seasons,

(*v*) Absence of mineral constituents in fodder and feeding stuffs.

(*c*) Please mention the months of the year in which fodder shortage is most marked in your district. For how many weeks does scarcity of fodder usually exist ? After this period of scarcity ends how many weeks elapse before young growing cattle begin to thrive ?

(*d*) Can you suggest any practicable methods of improving or supplementing the fodder supply that would be applicable to your district ?

(*e*) How can landowners be induced to take a keener practical interest in these matters ?

PART IV

17. Agricultural Industries.

(*a*) Can you give any estimate of the number of days of work done by an average cultivator on his holding during the year ? What does he do in the slack season ?

(*b*) Can you suggest means for encouraging the adoption of subsidiary industries ? Can you suggest any new subsidiary industries to occupy the spare time of the family which could be established with Government aid ?

(*c*) What are the obstacles in the way of expansion of such industries as beekeeping, poultry rearing, fruit growing, sericulture, pisciculture, lac culture, rope making, basket making, etc. ?

(*d*) Do you think that Government should do more to establish industries connected with the preparation of agricultural produce for consumption, such as oil pressing, sugar making, cotton ginning, rice hulling, utilisation of wheat straw for card-board, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc. ?

(*e*) Could subsidiary employment be found by encouraging industrial concerns to move to rural areas ? Can you suggest methods ?

(*f*) Do you recommend a more intensive study of each rural industry in its technical, commercial and financial aspects, with a view to, among other things, introduction of improved tools and appliances ?

(*g*) Can you suggest any other measures which might lead to greater rural employment ?

(*h*) Can you suggest means whereby the people could be induced to devote their spare time to improving the health conditions of their own environment ?

18. Agricultural Labour.

(*a*) What measures, if any, should be taken to attract agricultural labour from areas in which there is a surplus to—

(*i*) areas under cultivation in which there is a shortage of such labour ? and

(*ii*) areas in which large tracts of cultivable land remain uncultivated ?

Please distinguish between suggestions designed to relieve seasonal unemployment and proposals for the permanent migration of agricultural population.

(*b*) If there is any shortage of agricultural labour in your Province, what are the causes thereof and how could they be removed ?

(*c*) Can you suggest measures designed to facilitate the occupation and development, by surplus agricultural labour, of areas not at present under cultivation ?

19. Forests.

(*a*) Do you consider that forest lands as such are at present being put to their fullest use for agricultural purposes ? For instance, are grazing facilities granted to the extent compatible with the proper preservation of forest areas ? If not, state the changes or developments in current practice which you consider advisable.

(*b*) Can you suggest means whereby the supply of firewood and fodder in rural areas may be increased ?

(*c*) Has deterioration of forests led to soil erosion ? What remedies would you suggest for erosion and damage from floods ?

(*d*) Can you indicate any methods by which supply of moisture in the soil, the rainfall and supply of canal water can be increased and regulated by afforestation or by the increased protection of forests so as to benefit agriculture ? Would the same methods be useful in preventing the destruction by erosion of agricultural land ?

(*e*) Is there an opening for schemes of afforestation in the neighbourhood of villages ?

(*f*) Are forests suffering deterioration from excessive grazing ? Is soil erosion being thereby facilitated ? Suggest remedies.

20. Marketing.

(*a*) Do you consider existing market facilities to be satisfactory ? Please specify and criticise the markets to which you refer, and make suggestions for their improvement.

(*b*) Are you satisfied with the existing system of marketing and distribution ? If not, please indicate the produce to which you refer and describe and criticise in detail the channels of marketing and distribution from the producer to the consumer in India (or exporter in the case of produce exported overseas). State the services rendered by each intermediary and whether such intermediary acts in the capacity of merchant or commission agent, and comment upon the efficiency of these services and the margins upon which such intermediaries operate. Please describe

the method by which each transaction is financed, or in the case of barter, by which an exchange is effected.

(*c*) Do you wish to suggest steps whereby the quality, purity, grading or packing of agricultural produce may be improved, distinguishing where possible between produce destined for—

(*i*) Indian markets ?

(*ii*) Export markets ?

(*d*) Do you think that more effective steps might be taken to place at the disposal of cultivators, merchants and traders information as to market conditions, whether Indian or overseas ; crop returns ; complaints as to Indian produce from wheresoever originating ; and agricultural and marketing news in general ?

21. Tariffs and Sea Freights.

Do existing (*a*) customs duties, both import and export, and (*b*) sea freights adversely affect the prosperity of the Indian cultivator ? If so, have you any recommendations to make ?

22. Co-operation.

(*a*) What steps do you think should be taken to encourage the growth of the co-operative movement—

(*i*) by Government,

(*ii*) by non-official agencies ?

(*b*) Have you any observations to make upon—

(*i*) Credit societies ;

(*ii*) Purchase societies ;

(*iii*) Societies formed for the sale of produce or stock ;

(*iv*) Societies for effecting improvements—*e.g.*, the digging of wells and the construction of bunds, walls and fences, or the planting of hedges ;

(*v*) Societies formed for the aggregation of fragmented holdings and their redistribution in plots of reasonable size ;

(*vi*) Societies for the co-operative use of agricultural machinery ;

(*vii*) Societies for joint farming ;

(*viii*) Cattle breeding societies ;

(*ix*) Societies formed for any purpose connected with agriculture or with the betterment of village life, but not specified above ?

(*c*) Where co-operative schemes for joint improvement, such as co-operative irrigation or co-operative fencing or a co-operative consolidation of holdings scheme, cannot be given effect to owing to the unwillingness of a small minority to join, do you think legislation should be introduced in order to compel such persons to join for the common benefit of all ?

(*d*) Do you consider that those societies of which you have personal knowledge have, in the main, achieved their object ?

23. General Education.

(*a*) Do you wish to make observations upon existing systems of education in their bearing upon the agricultural efficiency of the people ? If you make suggestions, please distinguish, as far as possible, between—

(*i*) Higher or collegiate,

(*ii*) Middle school, and

(*iii*) Elementary school education.

(*b*) (*i*) Can you suggest any methods whereby rural education may improve the ability and culture of agriculturists of all grades while retaining their interest in the land ?

(*ii*) What is your experience of compulsory education in rural areas ?

(*iii*) What is the explanation of the small proportion of boys in rural primary schools who pass through the fourth class ?

24. Attracting Capital.

(*a*) What steps are necessary in order to induce a larger number of men of capital and enterprise to take to agriculture ?

(*b*) What are the factors tending to discourage owners of agricultural land from carrying out improvements ?

25. Welfare of Rural Population.

(*a*) Outside the subjects enumerated above, have you any suggestions to offer for improving hygiene in rural areas and for the promotion of the general well-being and prosperity of the rural population ?

(*b*) Are you, for instance, in favour of Government conducting economic surveys in typical villages with a view to ascertaining the economic position of the cultivators ? If so, what, in your opinion, should be the scope and methods of such enquiries ?

(*c*) If you have carried out anything in the nature of such intensive enquiry, please state the broad conclusions which you reached.

26. Statistics.

(*a*) Do you wish to make suggestions for the extension or improvement of the existing methods of—

(*i*) ascertaining areas under cultivation and crops ;

(*ii*) estimating the yield of agricultural produce ;

(*iii*) enumerating livestock and implements ;

(*iv*) collecting information on land tenure, the incidence of land revenue and the size of the agricultural population ;

(*v*) arranging and publishing agricultural statistics ?

(*b*) Have you any other suggestions to make under this heading ?

ROYAL COMMISSION ON AGRICULTURE.

MINUTES OF EVIDENCE

TAKEN BEFORE THE

ROYAL COMMISSION ON AGRICULTURE.

Monday, January 31st, 1927.

LUCKNOW.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai BAHADUR Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries.*)

Mr. G. CLARKE, F.I.C., C.I.E., M.L.C., Director of Agriculture, United Provinces.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) Agriculture is a Transferred Subject. Funds for the development of agricultural research depend on the vote of the Legislative Council. No power of certification exists.* This is the position with which the Minister and his agricultural adviser the Director of Agriculture have to deal.

The Council, therefore, has to be convinced of the soundness of the research programme. Like the members of all representative bodies, the members of the Council prefer work leading quickly to practical results. In this respect the Legislative Council does not differ from Parliament and County Councils in England. I have had experience of County Councils in England and of the Legislative Council in the United Provinces. I have no hesitation in saying that it is as easy to get money voted for research in these Provinces as it is in England, if the problems have a direct bearing on provincial agriculture.

*See also Question 34,234, page 87.

In the United Provinces Council agriculture is kept outside party politics. All parties are anxious for progress. In recent years, when the Agricultural Department has been the subject of debate, Ministers have been attacked on the grounds of not being able to obtain sufficient funds for agricultural research and development, on one occasion only for proposing too much.

I have served as Director and a member of the Legislative Council under three Ministers of different political views and for the five years March 1922, to March 1926, not a single cut has been made in the demands for grants presented by the Minister. There has been considerable detailed criticism but this is becoming more and more constructive and has always been helpful. In fact, it has led to the removal of many defects and we are now both with regard to the appreciation of the importance of research and the advancement of agricultural development generally in closer touch with the needs of the Province than we have been before.

The budget provision voted by the Council in 1926-27 was Rs.24.4 lakhs, the highest figure yet attained, of which Rs.3.9 lakhs was for higher agricultural education and research. This does not include large non-recurring expenditure on the extension of the Agricultural College. I think, therefore, that I am justified in the opinion that agricultural development (including research) has prospered under Council control in these Provinces and that no radical alteration is desirable even if it were possible in the present method of administration.

Removal of responsibility for the investigation of the fundamental problems of agriculture from the Council would, in my opinion, have a deadening effect on provincial development.

The Council should realise and I am convinced it now does, as the result of five years' experience, that it is one of its primary duties to provide for agricultural research. It would be a fatal mistake to make proposals which would lessen the sense of responsibility.

The agricultural development of the Province should be regarded as a whole and not as the problem of growing sugarcane, cotton, rice or any particular crop which leads to one-sided development if pushed too far. It is better that the whole agricultural development of the Province should be co-ordinated by the Director assisted by expert boards and committees under the general direction of a Minister responsible to the Legislative Council. For this reason I prefer, as stated in answer to Question 4 (*b*) below, to place the research staff of the Province on an adequate footing rather than to increase the scientific staff of the Government of India and to establish research stations in the Provinces controlled by the Government of India.

There is another aspect of the question of finance which presents difficulty sometimes, i.e., the state of the provincial finances. This may at any time limit the amount available for agricultural research. It may not be possible for the Finance Department to sanction the presentation to the Council of the Minister's full demands for agricultural research. At the moment, as the result of a series of good seasons, there is no complaint. The Finance Department is sympathetic but it cannot do impossibilities. The claims of elementary education, public works and public health have to be met. It is considered and considered rightly that the development of these must precede a general rise in the condition of the agricultural population.

The main requirement of my department is provision for a steady rate of progress. Violent fluctuations in financial provision are liable to throw us out of balance. At any time a series of bad seasons may make retrenchment inevitable and agricultural research is very likely to be the first thing to suffer.

It seems to me, therefore, that if the Government of India desires to advance the agricultural development of the Province it should be prepared to assist the Local Government with their agricultural budgets when they are unable to present full demands for research work to the Council owing to financial stringency or any other cause. A further safeguard that agricultural research should be uninterrupted, would be to assign a portion of the annual remission definitely for agricultural research and development.

(*b*) There is a dearth of experienced workers for the problems connected with plant breeding and crop improvement. This is traceable in part to the long delay in deciding on what basis permanent recruitment to the higher posts (including research posts) should be made. The question is still unsettled and the rules delegating powers to the Local Government are being reconsidered by the Secretary of States.

The production of better and heavier yielding varieties of crops is probably the most difficult and complicated problem facing agriculture in India to-day, but the introduction of a better variety of any of the staple crops leads, quicker than any other method, to an enormous increase in the value of the produce and the material prosperity of the cultivator.

Experience as well as high technical qualifications are required to obtain results in crop-improvement within a reasonable time. The present mode of attacking the problem is to appoint young graduates who have taken a good degree in natural science and have had a short training in research methods. They are also called upon to undertake teaching in the Agricultural College. It is not reasonable to expect immediate results of economic value. We have at the present time young officers working on rice, cotton, barley, oil-seeds and fibre crops and potatoes. I am not entirely satisfied with the rate of progress. I feel, in the first place, that we are not likely to produce a really efficient corps of workers such as will enable us in future to become self-supporting in the matter of crop research by setting young and inexperienced officers to work on these difficult problems without experienced and detailed technical guidance and secondly that the production of better varieties of crops is of such vital importance to the material welfare of the cultivator that we cannot afford to wait and take the risks of delay which our present method involves. Practically all the crops of the Province need immediate investigation.

What is needed in this Province is to replace the isolated workers on special crops by a combined section of plant breeding and crop-improvement under a senior officer of wide experience and achievement in this line of work. In this section all work on crop-improvement will be co-ordinated. It will be necessary to search the world to obtain a good man and a high salary will have to be paid for a short term agreement. It will pay handsomely in the long run if a good man can be found to give a salary of Rs.2,000 or even 3,000 for a five years agreement.

The section of plant breeding would absorb two of the three Economic Botanists leaving the remaining Economic Botanist free for higher botanical teaching in the Agricultural College.

The whole time staff of the new section would thus provisionally consist of (1) the Head of the section and (2) two Economic Botanists with their subordinate staff of Assistants, laboratories and research farms at Cawnpore and Raya. For (2) there is already provision in the provincial budget.

The additional facilities required will be another research station in a rice growing tract. This will be required immediately and later two other research stations for trying out the varieties produced as well as some extension of the existing research stations.

The Head of the section will organise the work of crop improvement in the Province and prepare a programme based on provincial needs. When

this has been approved, work of definite responsibility on one or two crops will be given to each officer of the section.

In addition to taking the intensive study of one or possibly two main crops himself, an important part, in fact the most important part, of the work of the new Head of the section will be to guide and train the young officers placed under him.

The scheme may be criticised on the grounds of additional expense but expense is justified by the possibilities of an intensive campaign of crop improvement in these Provinces.

The proposal has the advantage of providing a well balanced scheme based on provincial requirements. It ensures that the special problems of the Province will receive adequate attention. It is not at all likely that a research station for one crop under the Central Government would serve all Provinces equally well, or indeed, be able to cope with more than a mere fraction of the problems. The staff of a central institute would develop a preference for one Province and its problems would receive their attention. The establishment of a strong section devoted entirely to provincial crop improvement will preserve the local sense of responsibility for local problems which, as stated in answer to Question 1 (*a*), I regard as important at the present time. I think the scheme will be acceptable to the Council because it affords an opportunity by means of the highly specialised training that can be given to our young officers of making the Province self-supporting within a measurable period of time as regards a most important branch of agricultural research.

The provincial budget for recurring expenditure on economic botany (wholly devoted to research on crop improvement) is as follows. It is proposed to incorporate the above in the new section of crop-improvement.

Economic Botany	Rs.71,571

There is additional recurring provision for the teaching of botany in the agricultural college amounting to Rs.35,310.

This will be kept separate from and outside the new section.

The capital expenditure already made by the Local Government wholly for research in economic botany and plant pathology, *i.e.*, for research stations and equipment is given below. This does not include laboratory accommodation provided in the agricultural college, which will be still available for the new section of crop improvement.

	Rs.
Botanical Research Farm, Cawnpore	56,506
Cotton Research Farm, Muttra	1,18,767
Total	1,75,273

The additional expenditure involved in the appointment of a Head of the section of crop-improvement now proposed is given below:—

RECURRING.

Salaries.

	Rs.	Rs.
Head of section:		
Rs.2,000—50—2,250	24,000	
1 U.P.A.S officer:		
Rs.250—25—750	3,000	27,000
Establishment:		
3 Subordinate Agricultural Service officers on Rs.110	3,960	
2 clerks, Rs.100—5—150 at Rs.110 each ...	2,640	
4 peons on Rs.12	576	7,176

	Rs.	Rs.
Allowances:		
Travelling Allowance	5,000	5,000
Supplies and Services:		
Additional equipment required for new work	6,000	6,000
Contingencies	9,100	9,100
Total recurring		54,276
NON-RECURRING.		
Residence at Cawnpore		34,724
Total ...		89,000

The cost of the new research station proposed in the rice tract is estimated at Rs.2,41,680.

The additional expenditure required for equipment at the Raya Research Station is—

	Rs.
Laboratory	24,996
Equipment	32,500
Total	57,496

The total expenditure on the scheme as now presented is—

	Rs.
Capital	5,09,173
Recurring	1,25,847

The Local Government have already provided the following:—

	Rs.
Capital	1,75,273
Recurring	71,571

There is thus the following balance to be found:—

	Rs.
Capital	3,33,900
Recurring	54,276

This is a scheme which the Government of India, if desirous of furthering provincial development, can help the Local Government to carry out.

Suitable assistance is—

(*a*) To guarantee the salary and other incidental expenses of the head of the section or alternately to recruite the head of the section and place his services for five years at the disposal of the Local Government.

In this case the Local Government should be consulted before the final selection is made.

(*b*) To provide the capital expenditure required for a suitable residence for the Head of the section. Residences for some unexplained reason are difficult to get provision for, and the Local Government always hesitates to present demands for residence to the Council.

(*c*) To provide the capital expenditure required for an additional research station.

(*d*) To provide the capital expenditure required to increase the equipment of the existing research station at Raya.

The total of (*a*), (*b*), (*c*), and (*d*), as already stated, comes to:—

	Rs.
Recurring	54,276
Non-recurring	3,33,900

I realise that any provision made by the Government of India will have to be voted by the Central Legislature. I do not propose that the Government of India should hand over large sums of money to the Local Government without being able to ascertain that it is being spent properly for the purpose for which it is given. No Legislative Body would vote money without some form of control.

I would like to develop between the Central and Local Governments with regard to agricultural research the same relation as exists between the Ministry of Agriculture and the local authorities, University Departments of Agriculture and County Councils, who are responsible for carrying out research schemes in England. The Minister of Agriculture who is responsible to Parliament for the expenditure of funds voted for agricultural development keeps in close touch through his scientific adviser with the work of the local bodies by whom research schemes are being carried out.

The Government of India could provide for similar inspection of subsidised schemes by means of an Agricultural Commissioner and his expert staff.

(c) *Manufacture of synthetic nitrogen compounds in India.*—The Indian Sugar Committee, in paragraph 238 of their Report, drew attention to the importance of utilising power from hydro-electric schemes in India for nitrogen fixation by the cyanamide and other processes. The recommendation was made that cyanamide should be first investigated. Since the Sugar Committee's Report was published in 1920, new processes have been developed and it would probably now be advisable to investigate those for the production of synthetic ammonia compounds. However this may be, the question of manufacturing synthetic nitrogen compounds and so making India self-supporting in the matter of nitrogen fertilisers, is of great importance and its solution must precede the intensification of Indian agriculture. No action has been taken, or appears to be likely to be taken by the Government of India, on the Sugar Committee's recommendations. The problem requires highly specialised knowledge and it seems to me to fall within the class of problems covered by this question. It is an All-India problem and should be taken up by the Central Government.

Research into the expenditure of irrigation water.—In paragraph 290 of the Report* on Agriculture in the United Provinces, the Chief Engineer points out the necessity for the creation of a research division in the Canal Department. As he rightly says, the research should not be limited to the disposal of water on the fields but should include every phase of the transit of water from the canal-head works to the utilisation by the crop in the field. The problem falls into two parts. The research division of the Irrigation Department would account for water from the head-works to the field. Its utilisation after it has reached the field is for the Agricultural Department to investigate.

The complete investigation of the problem is very necessary at the present time, as an entirely new system of irrigation, *i.e.*, the Sarda canal is shortly to begin working.

Two things are required: (1) Research division in the Irrigation Department, and (2) a special research station for the investigation of the water requirements of crops in a typical Sarda canal area. Sitapur and Kheri are suitable districts. The development of this branch of investigation has been held up for want of facilities.

Marketing of agricultural produce.—Any one acquainted with the complexity of the interests involved in the collection and distribution of all kinds of agricultural produce in this Province, will hesitate to express any opinion regarding the special steps that can be taken to improve the present practice, with the incomplete statistical information now available.

*Not published.

Before the question can be adequately examined a great deal more information is required. In fact, the present practice is so intimately bound up with the life and social customs of people that attempt at change, not based on full and correct statistical information, would probably lead to disaster. I include this, therefore, in the list of subjects which have not received expert investigation.

QUESTION 2.—AGRICULTURAL EDUCATION.—I can answer this question better by giving my views (1) on education in relation to agricultural advancement and (2) on the lines on which development of agricultural education controlled by my department should proceed than by answering separately sub-sections (i) to (xiii). The information asked for will be given as the points raised occur in the context of my answer.

(1) *Primary Education.*—My colleague, the Director of Public Instruction, makes the following statement in para. 352 of the Report on Agriculture in the United Provinces.

"Without efficient education in the villages, movements which aim at raising the standard of life of the agricultural population and improving their economic position will make slow progress."

With this statement I agree. It applies probably with greater force to the introduction of improvements in the technical processes of agriculture than to any other phase of rural development.

It has been clear for many years to agricultural officers that a general rise in the standard of agricultural practice is retarded by the absence of general primary education among the mass of agricultural workers. The hesitation of the cultivator to adopt obvious and profitable improvements is due largely to the absence of the faculty of thinking for himself.

I put, therefore, the extension and improvement of primary education (on the lines laid down in para. 352 of the report referred to above) in the forefront of the programme of education in its bearing on agricultural development.

I attach more importance to the primary schools as training grounds of faculty than as places for imparting technical knowledge such as improved processes and so forth. The first and more important thing is to teach the village boy to read and write and to think for himself. The Agricultural Department by means of propaganda and demonstration can teach the technical processes of agriculture after primary school age (the right time to learn them) if the ground is prepared.

Agricultural Schools.—A vocational school of the Bulandshahr type is the point where the educational work of the Agricultural Department gets into closest touch with the sons of the larger tenants and the small zamindars. Those classes correspond closer than anything in India, to the farmer in England. It is they who have first-hand knowledge and get to grips with the real problems. Their influence on the mass of their uneducated or poorly educated neighbours (the cultivators) is immense. The schools, now being discussed as their name implies, teach practical agriculture and give instruction in new processes, the use of new machinery and methods of farming. I have no doubt that they will be the most powerful of all the Department's educational activities, in spreading detailed knowledge of modern agricultural methods through the countryside.

The agricultural school at Bulandshahr was started in 1921. Gloomy prognostications regarding its future were made. We have, therefore, had to move cautiously and to satisfy ourselves on several points before embarking on a larger programme of this type of education. I think now the results have proved the usefulness of the Bulandshahr school and of this type of agricultural education generally. There are at the time of writing 49 students in residence and 11 teachers under training of the Education Department. Since the school was opened 85 students have

passed out, the greater part of whom have settled down in their homes, to the work they would have done if they had not come to the school, and I am confident they are better equipped for that work.

Vocational schools are expensive, there is no doubt about that. The equipment of the laboratories, workshop and farm, must be first-class if any good is to be done. The teachers, moreover, must be highly trained in technical work. A large number of students cannot be instructed at one time. The total cost of the Bulandshahr School was non-recurring Rs. 2.75 lakhs. The recurring is Rs. 28,962. The main items of the capital expenditure are school buildings and laboratories, residences, land and equipment.

The teaching at Bulandshahr is in the vernacular and it is intended to take boys from the vernacular schools, preferably those in which preliminary agricultural teaching has been given. It is in the latter schools that the middle class boys of the Province who follow rural pursuits in after life are educated. We insist that all applicants for admission should furnish a proof of the possession of land or some other satisfactory indication of connection with rural pursuits. A few stray in who have no connection with the land, but I think we can claim now that we have got together a class who come with the object of using the knowledge they have gained in after life. All of them, I have no doubt, would like a post in the Agricultural Department if they could get one. The desire for Government service is incurable. I have been severely criticised in Council on several occasions for not guaranteeing posts to students of this school and I have to yield the pressure to the extent of making a certain number of appointments, seven since the school was opened.

I regard it as a matter of importance that no guarantee should be given of Government service. If this is done the whole object of the schools will be frustrated.

The average age of boys at Bulandshahr school is 19. This is a little old and we shall try in the new schools which we are proposing to open to get boys of slightly lower age. I consider the time has now come when we can safely increase the number of schools of the Bulandshahr type. There is a demand in Council for more. The latter body are not likely to recommend such expensive items as agricultural schools if they are not satisfied with the results of the one in existence.

Steps are being taken to establish vocational agricultural schools at Fyzabad for the Province of Oudh and Gorakhpur for the eastern districts. The total cost of each school which is to accommodate 70 to 80 boys is estimated recurring Rs.30,000, non-recurring Rs.2.75 lakhs. No difficulty is anticipated in obtaining funds for this in the provincial budget.

I now give my views on another important aspect of agricultural education referred to by the Director of Public Instruction in paragraph 345 of the Report on Agriculture in the United Provinces, namely, agricultural vernacular middle schools. It will be seen that the teaching of agriculture has been, or shortly will be, introduced into 20 vernacular middle schools in rural areas, at a total annual cost per school of Rs.4,000 non-recurring and Rs.348 recurring of which Government provides half the non-recurring, *i.e.*, Rs.2,000 per school in addition to the cost of training the teachers. The subject is taught by teachers trained by the Agricultural Department and assistance is given by the Deputy Directors in the management of the small school farms. The cost of the scheme is in the educational budget and the work is under the control of that department. It is yet too early to express a definite opinion on the results in this Province. It has been successful in the Punjab and is regarded, I understand, by the authorities there (I am open to correction in this point) as taking the place of vocational training in schools of the Bulandshahr and Loni (Bombay) type. As stated below, I cannot accept this for the United Province. At the

same time I consider that agricultural teaching in vernacular schools can become a powerful agency for agricultural development. The function of such teaching is to open boys' minds to the possibilities of scientific agriculture and most important of all to create the desire to learn more. If successfully developed it will influence numbers that no other form of teaching can hope to do and will thus go a long way to prepare the province for agricultural propaganda.

For development more funds are required to establish agricultural teaching in a larger number of schools. I do not think the Education Department will have any difficulty in obtaining funds. A larger number of trained teachers is required. It is important for success that the teachers should be knowledgeable about agricultural matters and able to make the school farms examples of good cultivation. Nothing is so quickly ridiculed in rural areas as bad farming. If my proposals for the extension of agricultural schools are accepted, the Agricultural Department would be able to turn out 30 trained teachers a year.

Another requisite for success is an Assistant Inspector of agricultural education who should be in the Education Department. His duty will be to inspect the agricultural classes and farms in all "vernacular" middle schools in which agricultural teaching is given and to see that the school farms are properly run. He must be an expert agriculturist as well as a trained teacher.

There is one point to which I wish to draw the Commission's attention. It is the necessity for a clear understanding of the difference between the schools of the Bulandshahr type controlled by the Agricultural Department in which agriculture is taught as a vocation, and the vernacular middle schools controlled by the Education Department in which agriculture is taught as an educational subject and part of a school curriculum. The two in no way clash. There is room for both types of agricultural teaching and the successful development of the second will lead to an increased demand for the first.

In the United Provinces purely vocational schools of the Bulandshahr type meet a distinct need. In these Provinces, especially in the Province of Agra, the system of land tenure has created a body of relatively small but substantial zamindars. Recent legislation has given them facilities for securing larger areas of land for their own cultivation. It is, in my opinion, of the utmost importance that their sons should be able to obtain instruction which will enable them to practise modern agricultural methods as soon as they reach the age at which this can be suitably given to them. Many boys of this class have a decided bent for agriculture. I want to see them encouraged to develop it to the full and not be forced to suppress it as they undoubtedly are in the institutions which give a purely literary education. These boys want something more than agricultural teaching in a middle school if they are to take their places as rural leaders and for this reason, as stated above, I consider there is need for a highly specialised technical training in schools of the Bulandshahr type as well as for agricultural teaching in middle school. I do not consider that the latter can take the place of the former.

Higher Agricultural Education.—(1) *Agricultural College.*—I now come to the position of the Agricultural College in the chain of agricultural education. It is an essential but very expensive link. For one thing without it the Agricultural Department will soon cease to function for want of trained staff. The present organisation, popularly known as the Agricultural College, combines the dual functions of a college and a research institute. For this purpose the laboratories and equipment are admirable. When the extensions now in progress are complete it will be equal, if not better than, any institution in the United Kingdom. The total capital expenditure on the buildings and equipment for research and teaching

laboratories, the farms, hostels, residencies and the like will amount to Rs. 16½ lakhs. There are separate laboratories for teaching and research, but with the exception of economic botany, both research and teaching in each of the five sections are controlled by the same officer. This is at the best a make-shift arrangement and an administrative device for getting more work done than is paid for. Like all such devices it is only partially successful. A separation of the two functions will be necessary sooner or later if a programme of research is undertaken commensurate with the economic needs of the Province. Such a separation has been forecasted in my proposals for the establishment of a section for crop-improvement. In this paragraph of my evidence, I deal entirely with the functions of the College as a teaching institution for agriculture.

I have been connected with the College for twelve years, first as a teacher and research officer and later combining these functions with that of Principal. My observations are, therefore, based on experience. The College has had many vicissitudes. In the early stages of its existence it suffered from all the mistakes which inexpert and inexperienced administration could make. As a result of more rational administration from 1914, it has settled down to a definite and useful work. Its functions are to give the sons of zamindars a training fitting them to manage their own lands and to provide recruits for the Agricultural Department.* At present it gives two courses of instruction (1) a four years course for the diploma of L. Ag., with an intermediate diploma controlled by the Board of High School and Intermediate Studies at the end of two years. The four years diploma course is, in all but name, a course for a University degree of B.Sc., in agriculture and (2) a second course of two years is a vernacular course. It is on similar lines to the course at the Bulandshahr school, but it is intended to cater for a different class, namely, the larger zamindar who is not educationally qualified for the four years diploma course. The two years vernacular course is popular and always full, although a greater part of the students in it belongs to a class who could be more suitably provided for at the agricultural schools when we have sufficient accommodation for them.

The Agricultural College will, I forecast, develop on the following lines:—

(1) The technical agricultural education of the larger landholders, providing at the same time for this class all the benefits usually associated with University education. It is not likely for some years that this class will be numerous enough to fill the college. As time goes on, however, there is reasonable expectation that far greater numbers will become educationally qualified for a University course. It should be the aim of the agricultural college to become the University of the land-owning classes.

(2) The training ground for the staff of the Agricultural Department and for technical departments in which a scientific training with an agricultural bias would be as suitable as, or more suitable than, a training in science or arts. The Co-operative Department is an example of such a department. The Oakden Committee whose report is before the Commission recommends in paragraph 51 that the recruitment of the staff of the Co-operative Department should be largely made from the graduates of the Agricultural College. This recommendation is a sound one. Training in agricultural science is an admirable preparation for the work among the rural population which the officers of Co-operative Department will have to carry out.

The officials of almost all departments in India are brought into daily contact with agriculturists of every class. In my opinion it would all be to the good if a larger proportion of these had a training such as given at the agricultural college. It would afford them a wider insight into,

*See Paragraph 154 of the Report on Agriculture in the United Provinces.

and give them a wider knowledge of, and sympathy with, the many problems and difficulties of the agricultural classes. Recruits who have received the type of University education in science and arts now given do not always possess these. If a larger number of executive officers such as Deputy Collectors and Tahsildars and even Police Officers were recruited from the Agricultural College, I think we should find agricultural progress accelerated.

I, therefore, advocate the development of the teaching side of the agricultural college on University lines.

To provide (1) University education for the larger landowners, (2) the training of such of the technical staff of the Agricultural and Co-operative Departments as require a University education in agriculture, and (3) the training of a proportion of the executive staff of other departments which come into close contact with the rural population. With regard to the latter it will be necessary for Government to fix a definite proportion of recruitment for the posts of Deputy Collectors, Tahsildars and possibly Police Officers.

The above programme would, I think, keep the college fully and usefully employed. As corollaries to this we should aim at the gradual separation of the research side by the creation of sections such for example, as I have proposed for crop improvement and (2) for unified control of all the teaching sections under the Principal, and (3) the gradual removal of the two years' vernacular courses to the agricultural schools.

(2) *Movements for improvement of the technical knowledge of students who have studied agriculture.*—This can be dealt with by establishing short courses of instruction in special subjects at farms and other centres where special work is being done.

The requirement of the moment in the United Provinces is instruction in intensive agriculture and the management of private farms where tube wells have been established.

We propose to meet this by establishing short courses of instruction by the Deputy Director and the farm staff at Shahjahanpur. In fact, we have already had a certain number of students for this course but its full development has been held up for want of suitable accommodation. This has now been arranged for. A grant for the erection of residential quarters for six students costing Rs.15,000 has been included in the Budget of 1927-28. This class of instruction can be given at the cattle-breeding farm at Muttra where facilities exist for short courses of instruction in cattle improvement and modern dairying.

Short courses can be established at practically every circle headquarters, the only additional expense being residential quarters for students which, as I stated above, is estimated at about Rs.20-25 thousand.

I have now given my views on the purely provincial development of education in relation to agriculture. They are summarised below:—

(1) Wide extension of primary education;

(2) An increase (say, of 20 per annum) in the number of middle vernacular schools giving agricultural instruction at a cost of Rs.4,000 per school, non-recurring and Rs.348 recurring;

(3) Two more vocational schools of the Bulandshahr type at a total cost for each school of

Non-recurring, Rs.2.75 lakhs;

Recurring, Rs.30,000;

(4) The development of the agricultural college on University lines under the unified control of the Principal, with the gradual creation of separate research sections for subjects of economic importance and the gradual removal of the vernacular courses;

(5) Short courses of instruction in special subjects at selected farms, and other centres of agricultural activity for improving the technical

knowledge of students who have studied agriculture. Immediate developments possible are short courses for intensive cultivation at Shahjahanpur and instruction in modern methods of dairy work and cattle improvement at the cattle-breeding farm at Muttra.

Pusa.—I conclude my survey by considering the position of Pusa in the scheme of agricultural education for India as a whole.

This Province and other Provinces have agricultural colleges teaching up to a degree standard in agriculture. Each Province is able to meet its own requirements as regards its present provincial services. But I am inclined to think that no Province is making adequate provision for training officers to fill the higher posts in the Agricultural Department, namely, those now filled by officers of the Indian Agricultural Service. Our object is to make India self-contained and self-supporting in all matters connected with its agricultural development. As things are if we desire to obtain officers for the important posts of Deputy Directors we have to recruit from those who have attended agricultural courses overseas either on their own initiative or by the grant of study leave. Officers thus recruited suffer from the disadvantage of having received their agricultural training in a foreign environment. They are as a rule no better qualified than the graduates of provincial agricultural colleges who are recruited for lower posts, except, in those cases (which are rare) where long periods have been spent in post-graduate study.

We require to develop in India an institution to continue the training given at the provincial colleges by means of a higher general course specialising in agricultural training. If I may be allowed to adopt the common phraseology of educationists in India, we require a college teaching up to M.Sc. standard in agriculture. This will provide a training ground for the higher agricultural posts in the department and we shall no longer be thrown back on foreign recruitment as we are at present.

No Province can afford to make its own arrangements for such training nor would the numbers required justify the institution of such a course; but for the whole of India numbers will be forthcoming to fill a central college. The development at Pusa of a higher course in general agriculture appears to be the obvious solution. The existing arrangements for teaching at Pusa are inadequate. Training is provided mainly for specialist officers in the various research sections. The main need of the Provinces is for officers with an all-round agricultural training, who will be able to undertake the work of Deputy Directors.

The number of students at Pusa at present is small. The numbers taking the regular courses were as follows:—

	1924-25.*	1925-26.
Agricultural section	—	2
Chemical section	1	2
Mycological section	1	3
Entomological section	1	—
Botanical section	2	3
Bacteriological section	—	1
	—	—
Total	5	11
	—	—

Teaching is not and never has been regarded as one of the principal activities. I do not desire nor intend to depreciate the work that has been done there but I am bound to state my opinion that the result of the research carried out at Pusa in the last twenty years, except as regards the improvement of wheat, has had no effect on the agricultural development

* Scientific Reports of the Agricultural Research Institute, Pusa, 1924–25.

of these Provinces; this is particularly the case with regard to the work of the agricultural section.

I advocate the development of Pusa as a purely teaching institution. In the natural course of events it seems clear that the main lines of research will have to be removed to provincial centres whatever course may be adopted with regard to their control whether it be provincial or central. Such a process has begun. Examples are the Institute of Plant Breeding at Indore, the Sugarcane Research Station at Coimbatore and the Institute of Dairying and Animal Husbandry at Bangalore.

The research activities of Pusa are bound to decline. There is danger of its splendid equipment not being utilised to full advantage. There is, however, a splendid future if it can be developed into a central college for the training of officers for the higher agricultural posts, particularly Deputy Directors.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—The methods of demonstration and propaganda are described fully in Chapter VI of the Report on Agriculture in the United Provinces.* They have been evolved slowly as a result of twenty years' experience, have stood severe tests and enabled us to make progress. It is only necessary for me, in answering this question, to draw attention to a few points which require emphasis.

In the first place, by far the most successful and also the quickest method of influencing and improving the practice of cultivators and of inducing them to adopt expert advice, is to cultivate under departmental control a small area of village land either by improved methods of cultivation, or by growing on it improved varieties of crops. By this means the cultivators are able to satisfy themselves quickly of the value of the new methods and also, what is probably more important, of the possibility of carrying them out under village conditions. This is the principle underlying our demonstration work throughout the Province and the methods used in different localities are variations in organisation only.

A well-run demonstration farm exerts a powerful influence in the long run on the agriculture of the district in which it is situated, but it is slower in operation on cultivators than demonstration on village land for various reasons. For one thing, the amount of capital involved frightens them. It is necessary to point out here that success of all kinds of agricultural propaganda amongst the cultivating classes depends on first-class technical work. Where propaganda fails, it is almost always traceable to some fault in the details of technical work rather than in organisation. Organisation is important, of course, as it enables the best use to be made of the facilities available. First and foremost, what the cultivator needs and instantly responds to is a demonstration of superior technical skill.

As regards the organisation of demonstration, I am inclined to favour the system of demonstrating in groups of villages (5 is a convenient number and represents in Rohilkhand an area of approximately 2,500 acres), which has been recently worked out for the Rohilkhand Circle and the new Sarda Canal areas. It is not possible or desirable to lay down any hard and fast rule as regards details of demonstration as long as the fundamental principle is observed. An organisation that succeeds in the hands of one officer may fail in the hands of another.

The village in this Province is the self-contained agricultural unit as is the farm in western countries.

The method of carrying out demonstration in a group of villages is as follows:—

A member of the Subordinate Agricultural Service qualified by training for the particular work in hand goes to one of the selected villages and makes it his headquarters. He is not allowed to leave his group of villages without permission. This seems a small matter but it is important as

*Not printed.

those who know India will realise. It is necessary at first to go slowly in order to avoid suspicion that the ultimate object of the department is to acquire a good slice of the best village land for its own use. For this reason operations in the first year are usually confined to hiring a small area of from ½ to 1 acre in one village for one year.

The demonstrator is provided with bullocks, improved ploughs and all the necessary tools for cultivation so as to interfere as little as possible with the ordinary routine of village work; he engages as part-time labourers a few intelligent youths of the village who ultimately become fieldmen and propagandists themselves. He proceeds to prepare the land for the crop, generally, in Rohilkhand, a crop of sugarcane grown by the improved methods worked out at Shahjahanpur. He gets on good terms with the cultivators and makes preliminary arrangements for establishing a seed store and supplying new implements.

The result of the first year's work is watched with critical interest by the cultivators. At the end of the season requests for assistance and seed begin to come in. The demonstrator is kept busy giving advice and assistance.

The method has been developed in the Rohilkhand Circle under my personal supervision and I give a detailed account of two centres. The first is a recently established centre and the second is one in which the demonstration may be regarded as satisfactorily completed. I will first describe the recently started demonstration centre at Kisarwa in the Budaun district. Irrigation from a tube well and pumping plant is being supplied to parts of three villages, Kisarwa, Shitabnagar and Amgaon.

The water is supplied at Rs.1.10.0 per hour for a full discharge which works out to Rs.5 per 4 acre inches for each irrigation. This is approximately Rs.25 for the irrigation of a crop of sugarcane and Rs.10 for a crop of wheat. Unless intensive methods of cultivation were adopted the water would not have been used at these rates.

A demonstrator was sent there in 1924-25, half an acre of land was hired for one year from a cultivator for Rs.12. A variety of improved cane selected at Shahjahanpur and known as S48 was grown by improved methods. An excellent crop was obtained which I estimated at harvest time at 950 maunds per acre.

The produce of the indigenous canes in the neighbouring fields was estimated at 350 maunds. The crop attracted a lot of attention and the produce of the whole plot was sold for seed.

In 1925-26 the departmental plot was increased to 6 acres, one acre for sugarcane and the remainder for the production of wheat seed with a little fodder for the bullocks belonging to the demonstration area.

The cultivators in the three villages assisted by the demonstrator prepared small plots on 10 acres of their own land according to the new method. They got excellent crops, worth, it is estimated, Rs.5,400. They could not have obtained more than Rs.2,100 from their own cane grown by their old methods.

In 1926-27 there are 26 acres of intensively grown cane in the three villages. The value of it is estimated at Rs.10,400 after making allowance for the fact that the cultivation of some of the new converts to our methods is not so good as that of the more experienced hands.

In addition to cane there are 525 acres of C46 wheat in the three villages estimated to produce an increased return of Rs.15 per acre.

The financial results of our work have put the cultivators of these villages on their feet. They have paid all their old debts and are probably, if the truth was known, cheerfully borrowing money again. But apart from the financial results, the evidence of agricultural activity and the air of prosperity is most encouraging. A seed store has been opened and the group of villages has become a centre of agricultural teaching for the whole district.

Mr. G. Clarke.

In 1925-26 the cost of Kisarwa demonstration to the department was:—

	Rs.
One demonstrator on Rs.65	780
One ploughman on Rs.12	144
Grant for running the tube well and pumping plant and demonstration	2,000
Receipt from sale of water and the produce of the demonstration plots	1,629
Total nett cost ...	1,295

The capital expenditure on equipment for the experimental plot was:—

	Rs.
Bullocks	400
Implements	121
	521

This description gives a fairly accurate picture of the course of events in establishing one of our group demonstration centres. I now proceed to give an account of a group of villages in which demonstration was started some years ago and except for occasional assistance may be regarded as complete.

In 1918-19 a small plot 1·25 acres of Shahjahanpur sugarcane was grown by the department in a village called Mundia in one best sugarcane *parganas* (Baragaon) of Rohilkhand. The group of seven or eight villages of which Mundia is the centre at the time our demonstration was started had 64 sugarcane mills and eight installations for concentrating juice into raw sugar (known as "bels"). These dealt with 30,780 maunds of juice.

In 1926-27 there are 146 mills as well as two large power mills and 18 bels and it is estimated that they will deal with 82,000 maunds of juice.

The total of area under sugar in 1918-19 was:—

Indigenous varieties	236
Shahjahanpur varieties	1·25
	237·25

In 1926-27 the area is:—

Indigenous	38
Shahjahanpur canes	235
	273

Confirmation of the financial results of our work in Mundia is found in the fact that the income tax paid by the *pattidars* of the village who cultivate land of their own and handle the whole crop of the tenants in the group villages has risen from Rs.168 to over Rs.1,000 per annum.

The group of villages has been the centre from which the cultivation of better varieties of sugarcane has spread throughout the *pargana*. The latest official returns show that, out of a total area of 4,120 acres, 3,285 acres or 79 per cent. are sown with the superior varieties selected by the Agricultural Department.

I have gone into some detail in these two cases because this method of demonstration is one which I propose to use in developing the new Sarda Canal areas.

The methods described above aim at improving the standard of agriculture of the cultivator with an average holding. The zamindar who is able to invest money in farming is an important factor in rural development. The zamindar interested in agriculture opens what is known in these Provinces as a private farm. This in practice means that he cultivates a considerable area of *sir* or *khudkasht* land by modern methods. Twenty years ago there was not a single privately-owned farm in existence. The latest returns show 621 managed with the assistance of the Agricultural Department. Approxi-

mately one-third are over 50 acres, one-third between 25 and 50 acres, and the remaining one-third small farms under 25 acres. All are adopting methods recommended by the department. I do not think it impossible to overrate their importance as a method of supplementing the demonstration work carried out by the Agricultural Department. We are encouraging them by grants-in-aid to undertake work of definite utility, chiefly seed production. In 1925-26, a sum of Rs. 25,000 was voted for this purpose. This was raised in 1926-27 to Rs. 35,000, and proposals have been made for a grant to Rs. 50,000 in 1927-28. The grants are from Rs. 2,000 to Rs. 3,000. Those receiving a grant are, as a general rule, required to enter into what is known as a "seed contract," that is, a legal agreement to grow and sell to the department for five years at fixed rates a quantity of seed specified in the agreement. Grants are also given occasionally for other purposes, such as the introduction of modern methods of dairying, cattle breeding and the like. The majority of our grants are, however, for seed contracts. We are, by means of private farms, demonstrating improved methods of agriculture and providing a non-official agency for seed production.

Up to the date of writing, grants-in-aid have been made to 30 farms and seed contracts executed for the production of 20,400 maunds of pedigree seed.

The zamindar who is contemplating capitalistic farming is more influenced by a well run and financially successful demonstration farm than by anything else. It is for this reason that I am in favour of making our demonstration farms work at a profit although I am aware that this view has been adversely criticised. There are certain disadvantages for instance, it rules out experimental work in some cases where it is essential. Balancing the advantages against the disadvantages, I am so convinced of the value of the demonstration of financial success in inducing the zamindar to take up farming that I consider the practice should be continued.

The Hardoi district which it is hoped the Commission will visit is the best example of the effect of a well-run demonstration farm on the agriculture of a district. The results are described in paragraph 175 of the "Report on Agriculture in the United Provinces." (See Appendix on Page 42 (i).)

QUESTION 4.—ADMINISTRATION.—I have indicated, in discussing the organisation of research in my answer to Question 1, the manner in which the Government of India can assist the Local Government, i.e., by capital and recurring financial assistance towards specific schemes. Definite proposals have been put forward for assisting research on crop improvement the rapid development of which I regard as a main factor in determining the rate of agricultural progress.

I am of opinion that the Government of India should undertake also to provide in every Province an agricultural statistical expert and a small staff (1) to deal with the material collected for the preparation of forecasts and other returns of agricultural importance, (2) to examine the mass of valuable material already in existence for the study of agricultural economics and (3) to initiate and carry out local economic inquiries. I shall deal more fully with this proposal in answer to Question 26. I wish, however, to point out at this stage that the statistics and forecasts are required mainly for an All-India purpose. There has been a tendency of late for the Director-General of Commercial Intelligence and Statistics to increase the number of forecasts and returns. If these were given the full attention they ought to have, this work would seriously restrict the technical work of the department. The Legislative Council has no sympathy with statistical work and would not vote the money necessary to expand it. The only division on the agricultural budget in 1926 was on a proposal to appoint a clerk for statistical work on cotton required by the Cotton Ginning and

Pressing Factories Act. In this division the member for the Upper India Chamber of Commerce voted against Government. The expenditure was so strongly opposed that I shall not recommend similar demands being placed before the House.

(*b*) As forecasted in a previous answer my view is that agricultural research should be developed provincially and not centrally. I consider that it should be carried out under the control of the Ministers and that each Province should aim at becoming self-supporting in all branches of agricultural research. Any proposals for central development would be misunderstood. It would be regarded by many as contrary to the spirit of the Reforms to transfer the development of agriculture to Ministerial control and then to say in effect: "You cannot organise the most important part of it; we are going to do it for you." The Government of India can and should provide more money than it does for agricultural research. The total expenditure of the Central Government on the Pusa Institute is Rs. 8.36 lakhs. This does not include veterinary research but can be taken as an index of the Government of India's financial contribution to the kind of research with which my department is concerned and which I am discussing. The contribution of the Government of India should take the form of assisting provincial Ministers to carry out their own schemes.

The increase of the scientific staff of the Government of India stationed at Pusa and working more or less out of touch with the local aspects of the problems they are investigating would not further agricultural development in the Provinces. I consider it has been proved by experience to be an ineffective method. Everything in India depends on being on the spot.

The method of utilising an increased scientific staff controlled by the Government of India would have to be one of the two following methods.

The establishment of research stations in the Provinces under the control of the Government of India and directed by the Agricultural Adviser. He might be assisted by a committee of management on which the Province was represented by the Director of Agriculture. An institute of this kind would be designed to meet the requirements of more than one Province. If it could be proved that it would do so effectively, this on the ground of economy would be an argument in its favour, but this cannot be admitted. In the first place, I shall consider a possible development, i.e., the establishment of a station for the production of better varieties of rice. If such were established, it would almost certainly be located in Eastern Bengal where the crop is one of major importance. There is no guarantee that the problems of this Province would receive adequate attention. In fact it is extremely likely that they would not. The Minister of Agriculture in the United Provinces would have no direct means of enforcing due attention to the needs of this Province, if the matter of the improvement of the rice crop was pressed on him in Council. He could only make representations to the Government of India and wait for results. A central institution located in another Province and not responsible to the local Council would have no difficulty in finding explanations, any number of them. The net result of central institutions would be that the Minister's powers of controlling and directing the agricultural development in his own Province would be restricted. In addition to this, the presence of agricultural workers in a Province who are not under the Minister's control would certainly not tend to promote smooth working.

Besides this I do not think the proposal is a good one on technical grounds. To follow out the hypothetical case I am considering, i.e., a central institution for rice. The production of new varieties of all crops with the exception of sugarcane for which there are special reasons is best carried out under local conditions. It is very unlikely that races produced in Eastern Bengal for instance would suit conditions in the United Provinces

as well as races produced here. At any rate it would involve delay for experimental work on selection.

My view is that for all the problems of which I have taken rice as an example there is ample scope and justification for more than one team of workers. Our rice crop for example is valued at over Rs.41 crores and is second in importance to wheat. We are fully justified in this particular case in having workers in the United Provinces.

The second method of employing an increased staff is to loan the services of specialist officers for a definite work for a term of years contributing at the same time a proportion of the expenditure required for equipment.

This is practically what I have proposed in discussing the establishment of a section of crop-improvement in the United Provinces. For administrative reasons and for developing the sense of local responsibility for local problems it would be better probably to guarantee the amount required and leave Local Governments to recruit their own officers, although this is not a matter of major importance. In this connection I again state that it is essential for the Government of India to retain the right of inspecting the work they subsidise by means of an Agricultural Commissioner in order that they may know that the money is being used for the purpose for which it was given.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—This subject has been dealt with in Chapter XX of the Report on Agriculture in the United Provinces.* I am certainly of the opinion that a legal remedy is not suitable in this Province. The advantages of scattered holdings are obvious to the cultivator. Of the disadvantages he is not yet fully aware. It is therefore largely a matter of education and this aspect is being taken up by the Co-operative Department.

My own view is that provided the size of the entire holding is economic the scattering of fields is not so great an impediment to the work of my department as it is popularly supposed to be.

Where tube wells have been constructed for supplying water to villages, we experience the maximum disadvantage of small fields but even here we have been able to overcome them in cases where we have undertaken concentrated village demonstration. I am willing to admit our difficulties would be less if we had larger fields, say, fields of 5 acres to deal with.

There is a great deal more co-operation amongst the villagers in this Province as regards interchange of labour than one would at first sight suspect and, from the point of view of my department, the village and not the holding is regarded as the unit for propaganda and demonstration work.

If any steps are taken at the present, it should be to prevent further reduction in the size of holdings but this is an exceedingly difficult matter to carry out.

QUESTION 8.—IRRIGATION.—My department is concerned with the development of well irrigation and I shall, therefore, confine my remarks to that branch of the subject. The proper department of Government will deal with canal irrigation.

As stated in the United Provinces memorandum, my department contains an Engineering Section especially equipped for dealing with problems connected with well irrigation. The technical controlling staff consists of:—

1st Agricultural Engineer (Rs.500—50—1,200).
2nd Agricultural Engineer (Rs.500—50—1,000).
3rd Agricultural Engineer (Rs.500—50—1,000).

The first and second Engineers are permanent and pensionable officers and the third is on a short-term agreement for five years. In addition, there are four Assistant Agricultural Engineers with lower qualifications

*Not printed.

on a scale of pay (Rs.250—25—500). None are members of the Agricultural Services. This, I think, is a mistake. All expert officers of the department should be on the same terms of service.

The budget provision for 1926-27 was Rs.3·41 lakhs.

The work is divided into two parts—

(1) The improvement of existing masonry wells.

(2) The construction of tube wells and the installation of power pumping plant.

The staff for the improvement of existing masonry wells deals with over 600 wells per annum. In 1925-26 the total borings made were 673, out of which 510 were successful. The distribution of boring staff varies from year to year but each district, where well boring is possible, is provided with a borer and in some cases two or three borers are placed in one district temporarily when the demand justifies such a course.

The details of the staff employed exclusively on the improvement of existing masonry wells in 1925-26 is given below:—

1	well engineer on	Rs.160—5—210 at Rs. 185
4	,, ,,	Rs.110—5—160.
1	,, ,,	Rs.155.
1	,, ,,	Rs.125.
1	,, ,,	Rs.110.
1	,, ,,	Rs.75.
1	driver on	Rs.35.
3	drivers on	Rs.30 each.
21	expert borers on	Rs.35 each.
10	,, ,,	Rs.30 ,,
20	,, ,,	Rs.25 ,,
51	mates on	Rs.12 each.

The total expenditure in 1925-26 was:—

	Rs.	a.	p.
Salaries of well engineers	6,721	9	0
Pay of drivers, borers and mates	26,399	10	0
Travelling allowance and contingent expenditure ...	6,152	15	3
Purchase of plant, repairs and renewals	51,683	12	2
Miscellaneous expenditure	1,355	12	0
Total	92,313	10	5

The expenditure in 1925-26 (Rs.92,313) was above normal and included non-recurring expenditure of Rs.14,000 for the purchase of new boring equipment which did not come into operation during the year. The total amount spent on the operations actually carried out in 1925-26 was Rs.78,313. The number of feet bored in connection with the improvement of 673 wells was 38,056 feet. The cost per foot was Rs.2·05.

The receipts amounted to Rs.11,263 or Re.0·29 per foot. Government, therefore, subsidises well boring at the rate of Rs.1·76 per foot.

The well owner pays the following charges:—

(1) Cartage of tools and equipment from the place where the borer has been working to the site of the well to be bored.

(2) Wages of 10 or 12 coolies required until boring is complete.

(3) Footage allowance to borer at Re.0-1-6 per foot for boring up to 50 feet and Re.0-2-0 for boring beyond that depth.

(4) Cost price of pipes and cutting shoes (if any) left in wells. The present rates are:—

2½-inch pipe at Re.0-14-0 per foot.

2¼-inch cutting shoe at Rs.6-2-0 each.

4-inch pipe at Rs.1-4-0 per foot.

4-inch cutting shoe at Rs.10 each.

The Government has definitely accepted responsibility for developing underground water supplies for irrigation purposes. We are advised that the best method of doing this is by means of strainer tube wells and power pumping plant. The main work of the Agricultural Engineering Section is the installation of these. Progress is dealt with year by year in Chapter IV of the Annual Administration Report of the department and a general account is given in Chapter VII of the Report on Agriculture in the United Provinces. Two hundred tube wells with engines and pumping plant have been completed protecting, it is estimated, over 30,000 acres and irrigating three-fifths of that area. The present staff and equipment can be expected to complete 50 annually, adding 7,500 acres to the protected area.

The conditions under which the construction of engines and pumping plant are undertaken are as follows:—

(1) No charge is made for the services and advice of the expert officers nor for the preliminary test borings. Plans and estimates are prepared free of cost.

(2) The cost of construction is borne by Government who provides the services of mechanics as well as the boring equipment required. When the estimate has been accepted, the money must be deposited with the Agricultural Engineer before work is commenced. This rule is strictly enforced.

(3) The zamindar pays for the strainer tube and the engine and pumping at cost price, that is, for the actual material left in his possession on the completion of the work.

(4) *Taccavi* grants are freely given up to approximately the entire cost of the well if necessary and grants-in-aid up to a maximum of Rs.3,000 are given in special cases to those who undertake seed contracts or to lease land for demonstration purposes. The grant of *taccavi* is made by the district authorities on the recommendation of the Agricultural Department. There is sometimes delay in the enquiries required. Attempts have been made to simplify the procedure, but it is a matter which is still capable of improvement.

(5) In cases of failure the money advanced is returned to the zamindar who incurs no expense.

The following figures give a reasonably accurate estimate of the "all in' cost of a 15 inch strainer tube well and pumping plant giving 35,000 gallons of water per hour. This would irrigate 150 acres in one season and fully protect 250 acres.

Paid by zamindar	Rs.8,000
Overhead charges borne by Government (1925-26) ...	Rs.4,987
Depreciation (10 per cent.) and interest (6 per cent.) on capital invested in boring equipment	Rs. 960
Total	Rs.13,947

Government subsidise the construction of tube wells and pumping plant to the extent of of Rs.6,000 per well exclusive of assistance in the form of *taccavi* and grants-in-aid. The costs given above do not include any profit on the undertaking, and in my opinion private firms would require something of the order of Rs.16,000 per well for similar work. It will be seen that the exploitation of underground water supplies is expensive, and also that this Government are providing generous assistance to those who wish to use it. This is justified by the increased prosperity rendered possible in areas commanded by tube well irrigation.

The cost per acre of a single irrigation by means of tube wells and pumping plant differs widely. This is expected when the number of variable factors influencing cost are considered. An average figure is not of great value. The Agricultural Engineer is of opinion that Rs.4 per acre for the

running cost of a single irrigation may be taken as a rough approximation, but tube wells and pumping plant have been installed giving water at Rs.2 per acre and others costing as much as Rs.8 per acre.

The following are actual figures taken from the accounts at the Shahjahanpur farm for a single irrigation of the *rabi* crop in December, 1926.

The well is not a strainer tube well but a masonry well bored with a plain pipe giving an estimated discharge of 10,000 gallons per hour with a lift of 38 feet. The discharge is not yet accurately known. The engine is a H type 16½ B.H.P. Ruston Hornsby crude oil engine fitted to a 6 inch centrifugal pump. This is larger than actually required for the present discharge. The water is distributed through masonry channels so that there is little or no loss from the discharge pipe to the field.

Area irrigated, 20·19 acres.
Time, 186 hours.
Crude oil used, 73 gallons.
Kerosine oil, 12 gallons.
Cylinder oil, 4·33 gallons.
Castor oil, 11¼ seers (23lb.).

The cost of materials at the farm was as follows:—

Crude oil, 9·58 annas per gallon.
Kerosine oil, 15.62 annas per gallon.
Cylinder oil, 42.00 annas per gallon.
Castor oil, 14.5 rupees per 82⅔ lb.

The running cost of a single irrigation works out to Rs.5-7-0 per acre, including the wages of the driver (1 per day) and a man and boy for distributing water in the field (at a total of 15 annas a day).

Experience has established certain facts regarding the economics of tube well irrigation. It does not pay unless intensive cultivation is adopted and unless some high priced crop such as sugarcane, potatoes or tobacco is grown. It is not a business proposition to irrigate only wheat or other *rabi* crops grown on the indigenous system with yields of 15 maunds per acre except in cases where the discharge is high and the lift low.

Tube wells are a powerful influence in the adoption of intensive cultivation. From a technical point of view, that is, from the point of view of demonstrating intensive methods of cultivation and also from the point of view of economy in construction, it would be better to concentrate work in one area for a number of years. Such areas are Gorakhpur and that part of Kheri not served by the Sarda Canal. This in the present circumstances is a counsel of perfection. As long as the money is voted by the local Legislature, we are obliged to consider individual applications on their merits. The only way in which a large scheme of concentrated construction could be carried out would be for the Government of India to subsidise the undertaking.

A scheme in Gorakhpur for a central station distributing electric power for pumping from ten large tube wells is making satisfactory progress. Six borings have been completed and the strainer tubes put in. Three have been tested and give on an average 40,000 gallons an hour. Before estimates are prepared for the installation of electric machinery it is necessary for all the wells to be thoroughly tested and the discharges and lift accurately known. The wells are, therefore, put into commission as ready with temporary pumping plant loaned by the agricultural department. It is not at this stage possible to give an accurate estimate of the final cost of pumping by electric power.

Expansion is undoubtedly required. Underground water-supply is the only unexplored source from which the irrigated area of the province can be increased. The United Provinces with its large submontane tract is more suitable for this form of irrigation than any other part of India. The

work is difficult to organise and to control with a number of widely scattered projects in hand at one time. Constant expert supervision is necessary for success and economy in construction. I consider that the salaries now given to the controlling officers will not attract men of sufficient ability and organising capacity to expand the work on the scale necessary for any real effect to be made on the agriculture of the province. I am of the opinion that there is a very real danger of a break-down in the event of casualties to any of the controlling staff.

QUESTION 9.—SOILS.—(*a*) In this connection I wish to point out the necessity of adequate drainage in that part of Rohilkhand which is served by the Sarda Canal. This is now, even without irrigation, the best sugarcane tract in these Provinces and the only one in which the manufacture of white sugar can be carried out profitably by the indigenous system of open pan boiling. Considerable progress has been made as regards the introduction of better varieties of cane. An intensive campaign of demonstrating intensive methods of cultivation is arranged for and will commence as soon as the Sarda Canal starts work. Nothing is so detrimental to the quality of sugarcane as badly drained soil. Drainage is of special importance in this tract over a great part of which the sub-soil water level is higher than it is in the irrigated tracts elsewhere in the Province. It has risen 10-15 feet in recent years as the result of copious monsoons. The question is receiving the attention of the Canal Department and large sums are being spent. I only draw the attention of the Commission to this, as it is, in my opinion, the most important drainage problem in the United Provinces.

(*a*) (ii) For many years both the Imperial and Provincial Departments devoted a large portion of the time of their scientific officers to the question of the reclamation of alkali *usar*. Valuable information was collected with regard to the movement of salts in the soil but no practical methods of reclaiming alkaline *usar* were worked out. Two experimental stations for the special study of this problem were maintained by the provincial department, one in the Aligarh district and one in the Cawnpore district. After 20 years' continuous work no methods were devised which could be profitably employed, for growing crops. The only possible chance of successfully utilising the bad type of alkaline *usar* found in the United Provinces is to grow certain type of trees and the experiment stations were, therefore, handed over to the Forest Department who have obtained a considerable success in their experiments.

My view regarding the question of reclaiming alkaline *usar* soils for agricultural purposes is that the chances of success are so small and the cost of the undertaking so high that the resources at present available for development are better employed in increasing the productivity of normal agricultural land the improved cultivation of which has every prospect of an increased return of 50 to 100 per cent.

(*b*) (*i*) I am not sure that I understand what is meant by this question. I have no knowledge of any improvement other than that brought about by the introduction and proper use of irrigation water and improved methods of cultivation.

(*b*) (*ii*) I have closely examined one area not in this Province but in the Gurgaon district of the Punjab in which marked deterioration by the spread of alkali was noticeable. This was on the Agra Canal. I should say that it is undoubted that some soils on the older canal systems deteriorated from alkaline formation some years after the canals started. This was long before my arrival in India and I have no knowledge of any appreciable deterioration in recent years.

QUESTION 10.—FERTILISERS.—I dealt with the question of the increased use of fertilisers in the material supplied for Chapter XV of the Report

of the Indian Sugar Committee. The position has not altered since that chapter was written, and all that is stated there applies with equal force to-day. Prices of fertilisers have fortunately dropped and the surplus production in other countries of all kinds of nitrogen fertilisers makes the position of India better as regards sources of supply.

It is not necessary for me to repeat the arguments accepted by the Indian Sugar Committee. I will only say again that if the urgent demand for increased food production is to be met and the full benefit of extensions of irrigation is to be realised it is essential that a supply of fertilisers should be available at reasonable rates.

The intensification of agriculture on which the advance of India depends cannot be brought about without them. The first use will undoubtedly be for highly priced crops such as sugarcane, potatoes and tobacco.

The Indian produced fertiliser most commonly purchased in the bazars is oilcake meals of various kinds. As pointed out by the Indian Sugar Committee, the export of oilseeds is a serious drain on the nitrogen supplies of India. Their recommendation on this should be considered.

Nitrate of soda, sulphate of ammonia and calcium cyanamide are imported. Various agencies are conducting suitable propaganda to extend their sales.

The question of preventing fraudulent adulteration raised in sub-section (*b*) of this question needs attention, not so much from the point of view of adulteration as from the point of view of seeing that the chemical substances imported and sold as manure are of standard quality. It is unlikely that compound fertilisers will come into general use in India for many years.

The increased use of standard substances such as Am_2SO_4, $CaCN_2$, $NaNO_3$, superphosphate and potash is likely. It is the duty of Government to see that inferior quality material is not dumped into India or if it is that it is sold on a nitrogen phosphate or potash basis. I do not think it is possible to attempt the control of small parcels of oilcake meal sold in the bazar at present. It is quite easy to judge the purity or otherwise by inspection. I should, therefore, be inclined to recommend an All-India Act as regards fertilisers only on the lines of the English Fertiliser and Feeding Stuffs Act and to limit its application by rules to imported fertilisers or fertilisers manufactured in bulk in India for the present.

The technical organisation exists. The Agricultural Chemists to Local Governments can undertake the work of provincial agricultural analysts and the Imperial Agricultural Chemist can be final referee in cases of dispute.

The methods of analysis published by the Pusa Institute can be made the official methods.

(*e*) It is already proved beyond doubt that phosphates, nitrates and ammonia salts, and potash are beneficial. What requires investigation is the method and economics of their application in India. This has not been sufficiently investigated. The use of such fertilisers has only just become possible. We know pretty well with regard to sugarcane the amount of nitrogen in the form of organic manures that must be applied for intensive cultivation and the best time to apply them, but we have not investigated the methods of applying an equal quantity of nitrogen as sulphate of ammonia or nitrate of soda. We do not know with certainty the effect of potash and phosphate on the quality of the various crops. All these points require investigation. I wish, however, to emphasise that such experiments to be conclusive are expensive. Reliable results will not be obtained by carrying out isolated experiments on small areas here and there.

It is essential that all experiments conducted with fertilisers should be carried out in such a manner that the probable error of the experiment can be determined.

QUESTION 11.—CROPS.—I have already drawn the attention of the Commission to the necessity of a strong section devoted entirely to crop-improvement. I have given the details of the organisation and the estimates of expenditure.

I am not technically qualified to lay down what procedure should be followed. As the result of experience, I should forecast that selection from the existing mixtures in the case of crops not yet investigated will in the hands of a competent worker lead to the quick production of varieties, possessing sufficient superiority to give an immediate increased production. This will be followed by the production of new varieties by breeding. This process is much more difficult and the results not so certain. It is, however, the fundamental method of producing better varieties and the initiation of intensive work should be delayed no longer.

Our extensive seed distribution system cannot be fully used for the benefit of the cultivator unless and until we have a wide range of better varieties of all crops to distribute.

An extensive organisation for the production and distribution of pure seed has been built up from small beginnings in the United Provinces. It is working well and is on a sound financial basis. The present conception of seed distribution is that it is a service for the benefits of which the users should be willing to pay a small premium in much the same way as the users of municipal water are willing to pay a premium for a commodity which can be obtained for nothing if purity and quality are not considered.

Over a long series of years (approximately 17) including years 1921-1922 of violent fluctuations in prices seed distribution has been carried on at a profit although in one year when the market was falling rapidly there was a loss. This is proof of two things:—

(1) That the business is organised on sound financial lines.

(2) That the purchasers are not asked to pay too high a price for the benefits derived from the use of departmental seed.

The following facts are of interest in the latter connection. The price of departmental wheat seed when all penalties for the non-fulfilment of contracts for payment are enforced is practically never more than 12 annas per maund over the market rates for wheat. In England the Government charge 35*s*. per cwt. for Yeoman II wheat* and farmers charge from 15*s*. to 25*s*. for 2nd year named wheat seed when the market rates are 12*s*. 11*d*. per cwt., for f. a. q. home-grown.

The seed distribution organisation in the United Provinces is capable of indefinite expansion not only in the hands of the Agricultural Department but also by other agencies such as Co-operative Societies for the production and sale of improved seed, and also by the owners of private estates.

I consider it is a *sine qua non* that production and distribution should be carried out by the same agencies, that is to say, if a society undertakes to distribute seed it should also undertake to produce seed. In our system production and distribution are intimately connected. We increase our stocks by the repurchase of seed distributed to selected growers whose crops are inspected.

The production of pure seed is the important part of the scheme. The actual distribution is simple. It is in connection with joint production and distribution that the Agricultural Department wants help from other agencies in order to reach its objective, which is that pure seed of better varieties of crops should be placed within the reach of every cultivator in the province.

Previous to 1922, the system of distribution was on a cash basis, that is, the seed was sold at sowing time and either paid for on delivery or the price was recovered at harvest charging the ordinary *taccavi* rates of interest (7½ per cent. per annum.)

*See also Question 34,221, Page 87.

This system worked well as long as operations were limited but it had certain drawbacks:—

(1) Bad debts were too frequent.

(2) No provision was made for increasing the stock of seed and operations were confined to the quantity of seed produced at the Government farms.

(3) In years of violent fluctuation in prices there was risk of loss to Government.

After a full examination it was decided to develope the issue of seed to cultivators on the grain *sawai* system, an indigenous system which when stripped of objectionable features introduced by the *bania* is generally acceptable to the cultivator.

The system consists of payment in kind for the seed given out. To every maund of seed taken at sowing time the cultivator brings back at harvest time 1¼ maunds. The normal price of one maund at sowing time is equal to the price of 1¼ maund at harvest time in the country districts where seed is distributed.

The small cultivator is seldom in a position to buy for cash payment. The grain *sawai* system encourages him to come forward for good departmental seed instead of relying on inferior seed obtained in te bazar at a high rate of interest. It is also an advantage to the department which automatically increases its stock of seed and is able to realise the amount of seed due at harvest time much easier than cash. By inspection of crops it is possible to maintain the purity of the stock.

A system of accounts has been standardised for use in connection with *sawai* seed distribution and has been worked out and is in use throughout the province.

A translation of the *sawai* agreement is given below. It will be seen that the groups of cultivators become jointly responsible. It is really a form of co-operative purchase.

"We the zamindars and cultivators named below beg to submit our application in accordance with Act XII of 1884 for certain quantities of seed as noted against our respective names, or whatever the Deputy Director of Agriculture is pleased to grant us for sowing purposes from the.....seed depôt and we promise to hold ourselves responsible jointly and severally to pay off the principal together with *sawai* interest and to observe the conditions mentioned on the reverse of the application which we have clearly understood.

1. Serial No.
2. Name of the applicant, together with father's name, caste and residence.
3. Status of the applicant, cultivator or zamindar.
4. Total area under cultivation.
5. Rent or revenue.
6. Kind of grain.
7. Quantity of grain required.
8. Signature of applicant.
9. Quantity of grain issued.
10. Signature of the issuing officer.
11. Remarks.

Attesting signature of the *Patwari*.

BOND.

"(1) We will use this seed for sowing purposes only and pay the principal, together with *sawai* interest (25 per cent.), from the produce of the crop for which we take the seed.

"(2) That we will pay off the principal, together with the *sawai* interest, at 25 per cent., either in kind or in cash. In case of payment

in cash, we shall pay the price of seed with *sawai* interest at the rate which may be prevalent in the nearest big market at the time of payment, for seed of the best quality of the kind which we have taken. If payment is made after the 31st of May, then the price will be fixed at the rate which prevailed on 31st May. This rate will be determined by the officials of the Agricultural Department. In addition to this price, we will pay extra annas 12 per maund to Government.

"(3) If payment of principal with *sawai* interest is made in kind the seed returned shall not be inferior to that which we have taken. If the seed is adjudged inferior by the officials of the Agricultural Department, the said department shall have the right in accordance with clause No. 2 of the bond to realise the price with a premium of annas 12 per maund in lieu of the payment in kind.

"(4) That as soon as the crops are threshed we shall send the seed (principal with *sawai* interest) or its price in cash to the said Seed Depôt. If payment is in kind we shall send it on our own carts to the said depôt.

"(5) That we shall pay in full the *rabi* demand, principal with interest before 31st May, that for *kharif* before 31st December. If the whole or any part of the price due remains unpaid after the expiry of the date fixed for the payment of the dues, interest at Rs. 7-8 per cent. per annum shall be charged on the price of the grain remaining due.

"(6) That if we take one or more bags from the department for taking away the seed, we shall pay for it in advance at current rate per bag.

"(7) That we, the applicants, shall be jointly and severally responsible for payment of the total demand. If the whole or any part of the total demand is left unpaid, then the Deputy Director of Agriculture shall have the power to recover it from the movable and immovable property of all or any one of us, or have the amount recovered through the Collector or Deputy Commissioner as arrears of land revenue. We have fully understood all these conditions and have duly received the seed entered in column 9 of this bond."

We have within the last two years utilised private farms for the production of pure seed. This method promises well, but it is rather early to make a definite statement. Grants-in-aid not exceeding Rs. 3,000 are given to the persons who already own or undertake to establish private farms on lines approved by the department, and in return for the grant the owner undertakes to grow certain varieties of crops and to sell for five years to the department at harvest time a specified quantity of seed. The amount is generally 200 maunds of wheat, but the conditions will be varied as the need for other seed arises. The terms are generous, and I am not aware of any other country in which such assistance is given to encourage intensive farming and seed production. We shall, if we are able to do so, stiffen up the terms of the contract. An example of a seed contract with the owner of a private farm is given below.

"An Agreement made between Sahu Shankar Sahai, son of Sahu Bhagirath Sahai, caste Vaish, resident of village Billari, in the district of Moradabad of the one part and the Secretary of State for India in Council (hereinafter called the Secretary of State) of the other part. WHEREAS the said Sahu Shankar Sahai has applied to the Government of the United Provinces of Agra and Oudh for a grant of Rupees three thousand to assist him in maintaining and cultivating his seed farm described in the schedule hereto AND WHEREAS the said Government has agreed to make the said

grant upon the terms and conditions hereinafter appearing. AND WHEREAS a grant of Rupees three thousand (the receipt of which the said Sahu Shankar Sahai hereby acknowledges) has been made him by the said Government. NOW IT IS HEREBY AGREED between the parties hereto:—

(1) During the term of five years from the date of these presents the said Sahu Shankar Sahai will grow on his said farm sugarcane, wheat and cotton of such kinds as the Director of Agriculture of the said Government may specify upon such areas of his said farm as the said Director of Agriculture may require.

(2) During a term of five years from the 30th December, 1925, the said Sahu Shankar Sahai will every year not later than the first week of May sell and deliver to the said Government, if so required, not more than 200 (two hundred) maunds of Pusa No. 4 wheat grown in such fields, or on such parts of his said farm as may be approved by an official deputed for the purpose by such Director of Agriculture as aforesaid and grown in such manner as such official may require and will allow the said official to remove from such fields or such part of his said farm all plants of wheat not of the kind known as Pusa No. 4, and will sell and deliver such wheat upon the term and subject to the conditions hereinafter appearing.

(3) For every maund of wheat sold by the said Sahu Shankar Sahai to the said Government in accordance with the terms of the second clause of this agreement the said Government will pay him at the market rate current in the week in which the same is delivered, or, in case of dispute concerning the rate then current at the rate of price for such wheat in the district of Moradabad in the first fortnight of May as published in the "United Provinces Gazette."

(4) The said Sahu Shankar Sahai will deliver such wheat in bags containing 2½ (two and a half) maunds each, a maund being for the purposes of this agreement reckoned as 82 2/7 (eighty-two and two-sevenths pounds). The said Government will pay the said Sahu Shankar Sahai for the bags in which wheat is delivered, such price as such Director of Agriculture may determine to be the current price for bags of the kind.

(5) If the said Sahu Shankar Sahai makes default in delivering the full quantity of wheat in accordance with the terms of clauses two and four hereof he will pay to the said Government as compensation for such default a sum of rupees two annas eight for every maund (of the quantity specified in clause 4 hereof) by which the amount delivered by him falls short of the amount specified in clause 2.

In witness whereof the parties hereto have hereunto set their hands the day and year first above written.

(Sd.) (Sd.) "

In 1926, 127 seed stores were operating in the United Provinces and distributed 105,052 maunds of improved seeds. Most of the stores are hired buildings in the bazaar. We are gradually replacing these buildings in which storage is frequently unsatisfactory by central seed stores constructed according to a standard plan.

By March, 1927, 19 central seed stores will have been constructed. Each seed store holds 2,000 maunds of grain. The recurring and non-recurring expenditure on each store is as follows:—

Non-recurring.

	Rs.	*Rs.*
Land	500	
Equipment	500	
Building	5,000	6,000

	Recurring.	Rs.	Rs.
1 member S. A. S. on Rs. 110		1,320	
1 Clerk on Rs. 30		360	
2 mates on Rs. 12 each		288	
Contingencies		100	2,068
			8,068
Advance for purchase of seed			10,000

I am proposing a steady increase in the number of central seed stores. The rate of increase is on the average five per annum. The central seed store, with smaller subsidiary seed stores connected with it, is a convenient unit for control of expenditure and audit purposes. This is an important administrative matter where a large volume of grain is handled in small lots. Another point in favour of central seed stores is that the danger of damage during the monsoon is reduced to a minimum.

The advances for seed distribution are chiefly met from an advance provided by the Government of India. The total amount of advances now used is Rs. 2.86 lakhs of which Rs. 1.71 lakhs is provided by the Government of India and Rs. 1.15 lakhs by the Local Government from the Famine Insurance Fund.

There has been considerable discussion regarding the method of financing seed distribution. The Government of India have been unable to provide further advances. The provision of funds by the Local Government from the famine relief fund has been questioned. Under the present arrangement the advances do not pass through the provincial budget, and are, therefore, removed from the purview of the Provincial Legislative Council. This is scarcely correct for a transferred department.

A proposal has been considered for making the advances required for the purchase of seed a budget item. This means that it would be voted annually by the Council and all cash receipts would be credited into the treasury. The scheme could be worked, but it would be cumbersome and likely at first at any rate to restrict distribution on grain *sawai*. The present method of advances is perfectly satisfactory, and I consider that the Government of India should continue to provide the Local Government with the advances required for seed distribution as a part of its contribution to agricultural development.

QUESTION 12.—CULTIVATION.—A large increase in the outturn of sugarcane can be obtained by the adoption of the Java method of cultivation. This has been fully worked out for Indian conditions at the Shahjahanpur farm. I do not propose to give the technical details of the cultivation here. The Commission will see the method in operation at the farm. This method can be used on well drained moderately light soil wherever irrigation is available and with improved varieties of cane results in 2½ to 3 times the normal yield of sugar. I give below the recorded cost of cultivation of a field of 3·28 acres which the Commission will see at the Shahjahanpur farm.

Area 3·28 acres.

	Rs.	A.	P.
Ploughing	125	8	6
Manure	279	0	4
Seed	155	1	1
Irrigation	178	5	2
Trench making	52	13	11
After cultivation	91	11	4
Earthing up	16	4	0

	Rs.	A.	P.
Watching	30	0	0
Irrigation necessary for keeping seed	29	11	6
Share of repairs to dead stock	16	8	0
Total ...	974	15	10

Per acre=Rs. 297.

The costs at the experiment station represent a maximum figure and will be reduced considerably on cultivator's and zamindar's fields under canal irrigation.

For example, two heavy items are: seed (Rs. 155) which is charged for at the rate of of Re. 1 per maund; irrigation (Rs. 178) which is very expensive owing to the use of an oil engine using kerosine instead of crude oil.

On cultivator's fields these two items will be replaced by seed at cost price, i.e., 4 annas a maund and canal irrigation at Rs. 8 per acre for the whole season. The total cost on a field of 3·28 acres being Rs. 39 and Rs. 26, respectively. It is estimated that cultivators and zamindars can grow a crop of 800 maunds per acre of improved varieties of sugarcane by this method at a cost of 4½ annas a maund.

This method has widely been adopted in the tube well irrigated areas of the Hardoi district which the Commission will see. It has been successful wherever it has been introduced. A wide extension of demonstration is proposed in the Sarda Canal areas as soon as the system starts work.

QUESTION 14.—IMPLEMENTS.—It is a mistake to assume that the existing implements used by the cultivator are no good. They are the result of generations of experience and are suitable for a great deal of the work they are called on to do. The indigenous implements now in use in these Provinces can never be entirely superseded under the prevailing conditions of soil and climate.

The position is that the latter require supplementing by improved ploughs, harrows and the like if a higher standard of cultivation is to be introduced. Suitable implements have been selected by the Agricultural Department. The introduction of these has been fairly satisfactory up to date. A total of 9,062 improved implements were distributed by the Agricultural Department in 1926. The cultivator wants convincing of the usefulness of new implements before he will invest money in them. This is a regular part of our demonstration system.

All demonstration centres, seed stores and other agricultural institutions carry a stock of selected implements which are purchased either on cash payment or by means of *taccavi* loans which are granted by district authorities for the purpose. The existing *taccavi* rules are suitable and advances are freely used by the cultivators.

I consider that the issue and recovery of *taccavi* advances is best done by the revenue authorities acting on the advice of the local agricultural officer. The cultivators are accustomed to deal with the district officials in all matters relating to *taccavi*. The only complaint is the delay which occurs in issuing the advance.

It is obvious that the introduction of improved implements for 35 million acres of cultivated land cannot be carried out by a Government Department. Private enterprise is necessary. Many Indian firms are specialising in the manufacture of implements of approved design. They are producing a good article at a fairly reasonable price. Progress is being made slowly and would be much faster if the firms were in closer touch with the markets.

The tendency is for firms dealing in all kinds of agricultured goods, manures as well as implements to rely solely on the Agricultural Department as their sales agents. Insufficient effort is made to explore the possibilities of the markets themselves. Nothing is done beyond the common forms of advertising, i.e., printed pamphlets and sheets in the vernacular. This, of course, is of very limited application in a country where the majority of the cultivators cannot read.

All the help the department can give to private firms is given. They are allowed to store a certain number of implements at our seed stores and so forth. They are put into communication with intending purchasers.

With regard to agricultural machinery as distinguished from tillage implements, the greatest need is to replace the slow and tedious but not necessarily inefficient methods of handling crops by the use of power-driven machinery. Small power-driven sugarcane mills and threshing machinery would effect an enormous saving of bullock power. Both are capable of being run on co-operative principles.

QUESTION 15.—VETERINARY.—I consider the Veterinary Department should continue to be controlled by the Veterinary Adviser. It is a professional service and the problems can only be appreciated and dealt with effectively by a professional head. Such observations as I have been able to make in the course of my duties as Director of Agriculture lead me to the conclusion that the effectiveness of the Veterinary Department would be immeasurably increased by the transfer of the control of the subordinate veterinary staff from the District Boards to the Head of the Veterinary Department. This means that a Subordinate Veterinary Service will have to be organised on similar lines to that of the Subordinate Agricultural Service. I am strengthened in this view by the results of attempts to co-operate with the agricultural committees of the District Boards with regard to the general agricultural propaganda and education.

QUESTION 16.—ANIMAL HUSBANDRY.—The present position of cattle breeding is explained in detail in Chapter VIII of the Report on Agriculture in the United Provinces.* The technical problems will be dealt with in the evidence of the Deputy Director in Charge of Cattle Breeding Operations, who will also be one of the witnesses examined. I shall, therefore, confine my remarks to the administrative side and to placing before the Commission my views regarding the expansion immediately desirable.

The two cattle farms in the Kheri and Muttra districts were transferred to the Agricultural Department from the Civil Veterinary Department in 1922. They were placed under the control of a special officer, and the organisation of the cattle breeding section of the department was commenced.

The technical staff at present consists of:—

One Deputy Director (Rs.500—50—1,500).
One United Provinces Agricultural Service Officer (Rs.250—25—750).
Seven Members of the Subordinate Agricultural Service (Rs.110—270).
Two Farm Overseers (Rs.90—5—200).

The budget grant for 1926-27 was Rs.2·13 lakhs.

Government is advised on all matters of policy by a Provincial Cattle Committee established in 1922. The composition of the Committee is as follows.—

(1) Director of Agriculture (Chairman).
(2) Veterinary Adviser to Government.
(3) A member nominated by the British Indian Association.
(4) A member nominated by the Agra Zamindars Association.
(5) A member nominated by the United Provinces Zamindars Association.

*Not printed.

(6) } Two members elected by the United Provinces Legislative
(7) } Council.
(8) }
(9) } Three members nominated by the United Provinces Government.
(10) }
(11) Deputy Director in charge Cattle Breeding Operations (Secretary).

This committee is one of the most useful and regularly attended of our expert committees. All matters relating to cattle in the United Provinces are referred to it for opinion by Government. The policy of the cattle-breeding section with regard to technical work, propaganda, the method of issuing bulls and the like is discussed, and all items of new expenditure are considered before demands for grants are submitted to the Council.

As a result, we are able to work on a definite policy which has public approval. I consider the development of cattle breeding under a special officer as one of the successful efforts of the Agricultural Department. I do not anticipate any difficulty in obtaining the grants required for new expenditure.

The number of bulls issued from the two cattle-breeding farms is given below:—

1922-23	46
1923-24	72
1924-25	79
1925-26	100

In June, 1926, 374 departmental bulls were at stud in various parts of the province.

Up to a recent date bulls were distributed almost entirely on loan mainly, though not exclusively, through district boards. They remained the property of Government, and were ordinarily returned to the farms at the end of five years. The Boards selected suitable persons to keep the bulls, and paid the way expenses to and from the farms in addition to two-thirds of the cost of maintenance, one-third being provided by the person who kept the bull. This scheme was necessary in the early stages to popularize the use of improved breeding stock, but it is now being replaced by the direct sale of bulls from the farms at the following rates:—

	Two years old.	*Three years old.*	*Four years old.*
	Rs.	*Rs.*	*Rs.*
Montgomery Kosi Hissar ...	80	150	200
Kherigarh Parchar	60	100	120
Murrah buffaloes	150	200	250-275

In order to develop the controlled breeding areas to which reference is made below, the Cattle Committee have approved of a scheme by which breeders in these areas can obtain a bull at one-third the above cost plus way charges from the farm.

In addition to the above, bulls are distributed on special terms to persons desirous of dedicating them for religious purposes, but the demand under this head is not great.

The new expenditure 1926-27 on the cattle-breeding section is given below.—

	Rs.	*Rs.*
(1) Extension Madhurikund farm.		
Non-recurring	90,145	
Recurring	9,622	99,767
(2) Model dairy Madhurikund farm.		
Non-recurring	18,063	
Recurring	4,276	22,339

	Rs.
(3) Purchase of 145 bulls for distribution	10,000
(4) Construction of Silo Towers	5,000
Total	1,37,106

This will increase the number of bulls available for issue, but the supply will still be inadequate for the needs of the Province. We are still relying too much on purchasing surplus stock from the Punjab farms.

Our object is to establish a cattle-breeding farm in each of the main cattle-breeding tracts. One is immediately required in Bundelkhand. The estimated cost is:—

Non-recurring, Rs.2·13 lakhs.

Recurring, Rs.0·23 lakhs.

Proposals will be placed before the Council in March, 1927, for the expenditure required in 1927-28.

An increase in the technical staff is required. The immediate requirements I put as follows:—

(1) A second Deputy Director on Rs.500—50—1,500.

(2) Two United Provinces Agricultural Service Officers with special training in Animal Husbandry on Rs.250—25—750.

(3) Ten members of the Subordinate Agricultural Service on starting pay of Rs.110.

The establishment of controlled breeding areas is a most promising line of work, and we propose to increase the number as soon as the staff is available. There are at the present time three controlled areas in Muttra and Etawah districts. The organisation of two is well advanced. A detailed description is given in Chapter III, page 16, of the Annual Administration Report of 1925. It is important to note that controlled breeding areas will enable a record of breeding operations to be maintained, which is not possible when the distribution of bulls is scattered over a wide area of the Province.

A point which requires investigation and is receiving attention at the cattle-breeding farms is the intensive cultivation of fodder crops. This appears to be only means of permanently improving the efficiency of the cattle of many tracts. I do not think that a Fodder Specialist is required. The improvement of fodder crops can be taken up in connection with the general question of *kharif* crops by the section of crop improvement which I have proposed in a previous answer. The cultivation problems can be investigated at the cattle farms.

The improvement of cattle is one which the agricultural sub-committee of District Boards have been able to undertake with some measure of success. Grants are regularly made by the United Provinces Board of Agriculture towards schemes initiated by District Boards. These usually take the form of purchasing and maintaining a certain number of stud bulls for use with selected herds.

In 1926 grants approximately of Rs.1,200 each were made to nine District Boards. It is proposed to continue grants in cases where satisfactory reports are received.

QUESTION 17 (*d*).—AGRICULTURAL INDUSTRIES.—Government should fully explore the possibilities of establishing in the United Provinces the manufacture of sugar by modern methods.

The agricultural work relating to the production of large yields of good quality cane has been done. It is quite possible that the large centrals of Cuba and Java will not be suitable in India. For one thing the transport of the cane for long distances adds to the cost of production. I do not know if any large central in India works up to its full capacity over a series of years. I think a promising line of development likely to decrease

difficulties connected with a full supply of cane is the establishment of a chain of small factories under unified technical control, but until one such unit is in actual operation it is not possible to give a definite opinion.

I recommend the installation of one unit crushing 60 tons of cane a day for experimental purposes. There are many areas in Hardoi and on the new Sarda Canal areas where the conditions are suitable.

The overhead charges of working a single experimental unit would be high, but no loss is estimated on it.

I give below an approximate balance sheet:—

Capital.	*Rs.*
Cost of machinery	2,00,000
Working capital	1,00,000
	Rs.3,00,000

60 tons of cane per day for a season of 80 days = 129,600 maunds of cane, say, 130,000 maunds of cane. This will require 250 acres of improved cane and about twice that area of indigenous cane. The outturn of sugar will be 8 per cent. from improved canes and the outturn of molasses 3 per cent.

Receipts.	*Rs.*
10,400 maunds sugar at Rs.12 per maund	1,24,800
3,900 maunds molasses at Rs.3 per maund	11,700
	Rs.1,36,500

Expenditure.	*Rs.*
Manufacturing cost of 10,400 maunds of sugar at Rs.4-8 per maund	46,800
Cost of 130,000 maunds of cane at 7 annas	56,875
Depreciation	20,000
	Rs.1,23,675

Manufacturing charges have been put at a very high figure. They will be much reduced in a chain of small factories under unified technical control.

The experimental unit would therefore be expected to give a profit of Rs.12,825 per annum or just over 4 per cent.

QUESTION 20.—MARKETING.—I propose to discuss three commodities, wheat, raw sugar and cotton. The value of these crops in the United Provinces is 44.14, 41.16 and 3.04 crores of rupees respectively.

Local practices vary, but the differences are in detail and not in principle. Examples illustrated by the three crops at any place give a picture of marketing operations in the Province.

I have stated in a previous answer that we have not sufficient statistical information regarding the charges incurred at the different stages of distribution to make a complete examination. It is only possible to make broad generalisations and to indicate the points where further inquiry is likely to prove fruitful. Accurate information can no doubt be obtained, but it is difficult to get. The collection will take time and require the services of a special officer. Merchants and others connected with trade in produce are extraordinarily reluctant to give information about the details of their business transactions.

Wheat.—A system of weekly and bi-weekly markets in large villages and small towns exists throughout the Province. The cultivators bring their grain to them and sell to merchants (*banias* and *banjaras*) who operate on a small scale. The rate in these markets is lower than the rates in the larger

grain *mandis* which are in touch with the export trade. I do not know what the difference is in various parts of the Province, but in the country markets of Rohilkhand with which I am familiar a difference of one seer per rupee may be taken as within the limits of possibilities. This means that, if wheat is selling in the large distributing markets at 8 seers per rupee or 80 annas a maund, the producer who brings his grain to the village markets gets 9 seers per rupee or 71 annas per maund, a difference of 9 annas. The small market is the point where the producer first comes into contact with the buyer. The competition amongst buyers is not keen. There are generally few. It is here that the cultivator is most likely to be hampered in his efforts to obtain full value for his produce, partly by the lack of information, partly by financial embarrassments and partly owing to his isolation. News travels with rapidity in India. The price of grain is a universal topic of conversations amongst wayfarers of every class. It is unlikely that villages even in remote places are without some knowledge of the movement of prices. However this may be, the small collecting market in the hands of one or two small buyers to whom the sellers are usually under financial obligations is the stage of marketing which needs immediate investigation. It is necessary to know, for instance, for all parts of the Province the rates prevailing in the villages and small collecting markets in order to compare them with the prices prevailing in the large exporting centres. This in itself is an investigation of some magnitude.

Many cultivators bring their own produce directly to the larger markets in order to get the higher prices prevailing there. We thus get the whole crop in small consignments transported in country carts coming into the export markets where the price is regulated by world prices, when there is surplus for export, where there is competition amongst buyers and information regarding price movements.

When scarcity is anticipated by unfavourable monsoon reports, when stocks are low, there is certain amount of gambling. The result is a rise of prices above the world prices. The situation in recent years has been adjusted by imports from Australia. In 1921 the most disturbed year in recent history with a short crop in India and world markets unsettled and jumpy the normal relation between Indian prices and world prices was adjusted by imports before the new crop was harvested.

The producer stands to gain by a rise in prices due to incidents of this kind. Severe or prolonged famine, of course, would create exceptional circumstances requiring measures for the regulation of prices.

The question of marketing is so far as it relates to the producer obtaining a fair price for his grain is best considered in a season when there is a surplus for export.

The carts bringing the consignments of grain into the central grain market are met some miles away by the *arhatia's* servants whose business it is to persuade the cartmen to take the grain to a particular *arhat*. These gentlemen live on what would be called " tips." Any one who has listened to a dialogue on the road side between one of them and a cultivator bringing in a cart load of grain will be satisfied that the cultivators are quite able to hold their own. On arrival at the bazar the cart goes to the *arhatia* or commission agent, who disposes of the grain, selling it to the large exporting merchants. The *arhatia's* commission in the Hardoi district is stated to be one per cent., but I think further investigation will show this figure needs revision.

It is difficult to distinguish at sight between cases in which the *arhatia* acts as a commission agent and as a purchaser using his own money. Most *arhatias* act in both capacities. It is universal for grain to pass through the hands of the *arhatia* before it reaches the exporting merchant. During its passage through the bazar to the exporting merchant a number of charges are incurred. Figures which have been collected for the Hardoi

district are given below. These figures are, I am inclined to think, pitched too high and can only be taken to indicate the amounts in a general manner. Taking as a basis 100 maunds of wheat Rs.5 per maund, the following charges were incurred in the bazar at Hardoi in the season 1926.

	Rs.	*A.*	*P.*
Weighing charges	8	6	7
Market dues	0	5	0
Charity	0	1	3
Menial servants	0	1	3
Cleaning charges	6	4	0
Arhatia's commission	5	0	0
	20	2	1

This works out to 3·22 annas per maund. In addition to this the transport charges taking an average of 15 miles from the local markets comes to 1·5 annas per maund.

The total charges on one maund of wheat from the village to the merchant who puts it on rail for export comes to just under 5 annas a maund when wheat is selling at Rs.5 per maund.

To determine the price which will be offered in the larger up-country markets it is necessary to ascertain also the charges which have to be added to the cost of wheat before it is placed on the final market. These fall into three parts.

(1) The first refers to the charges incidental to placing wheat f.o.r. at the port of shipment after purchase in the up-country export markets.

(2) The second refers to the charges from f.o.r. to f.o.b.

(3) The third refers to the charges subsequent to shipment (freight, insurance, &c.). These, together with the cost of handling in the up-country markets, give a measure of the total charge from the point of purchase to the point of distribution. Published information on these points does not exist. As far as I am able to see, difficulty will be experienced in getting it. No export firm could be expected to disclose to its competitors its method of working and its computation of working charges. An examination of the prices of hard foreign wheat in England and the wholesale prices in India, considered in conjunction with export, enables one to arrive at rough approximation.

A comparison shows that the difference between the prices of hard foreign wheat in London and the wholesale price in India is round about 30 annas per maund of 82 2/7 lbs. when export is brisk.

An analysis of this difference will show where the main charges are incurred. A high degree of accuracy is not claimed for the statements now put forward. The most that can be said is that they furnish a basis for discussion. The charges subsequent to shipping are somewhat difficult to assess, but with the freight at present ruling a round figure of 10 annas will not be found to be far out. This leaves 20 annas to be divided between:—

(1) The charges incidental to placing wheat f.o.r. at the port of shipment, and

(2) The margin for charges between f.o.r. to f.o.b.

Roughly speaking, it may be said that it takes about 11½ annas to place f.o.r. at the ports a maund of wheat purchased in the United Provinces. Of this 11½ annas, 10 annas represent freight. The remaining 8½ annas constitute the charges f.o.r. to f.o.b. or perhaps more accurately the margin within which the exporters have to work at the ports.

The approximate amounts of the intermediate charges between the point of purchase and the point of shipment can be tabulated as follows:—

	Annas per maund. (*Maund, 82 2/7 lbs.*)
Transport from smaller collecting markets to larger markets	1·5
Handling commission and other charges incurred in up-country markets	3·2
Charges incidental to placing f.o.r. at port ...	11·5
Margin for charges incurred f.o.r to f.o.b. ...	8·5

From what has been said above it is clear that the cultivator could be greatly benefited by better organisation of the small collecting markets and agencies. He receives, it is estimated, a rate 1 seer per rupee less than the rates in the larger grain markets. The expenditure incidental to placing wheat on the latter market is small, the main item being transport, which does not exceed 2 annas per maund.

It is not at all easy to suggest just what can be done by Government at once. In my opinion, matters will not materially alter until the economic condition of the cultivator is changed; in short, until education and a higher standard of agriculture have made him a better business man, but this is a far distant ideal.

Government purchase and regulated markets I rule out at once as impracticable propositions. Societies for the co-operative sale of agricultural produce are difficult to manage. The Oakden Committee, whose report is before the Commission, considered this question in 1926, and did not recommend them until the Co-operative Department had put rural credit on a sounder basis. In view of the opinion expressed by an expert committee, I hesitate to recommend such societies in this Province.

Much can probably be done by a wider distribution to smaller markets of information regarding market conditions. A service of weekly telegrams from district headquarters to smaller markets within reach of a telegraph office would ensure prices prevailing in up-country export markets becoming more widely known throughout the countryside. Telegrams could be sent to the village schoolmaster, for posting in the markets by him.

Other measures that suggest themselves to me are the following:— (1) the possibilities of the extended use of motor traction for transport to the railway. A service of motor lorries connecting the smaller and larger markets might lower the cost of transport and relieve bullocks for cultivation work. (2) The expenses incurred at all stages of marketing for cleaning, as well as the heavy deductions for quality now necessary, would be lessened by the use of modern threshing machines, preferably run on co-operative lines.

(3) Loss during storage would be avoided by the provision at collecting markets of small *pucca* godowns on the lines of the central seed depôts of the agricultural holding from 10,000 to 20,000 maunds of grain. This would be expensive. Such godowns would cost approximately Rs.12,000 each. They would have to be built by Government and leased to small merchants. This would add, of course, to the handling charges in the collecting markets.

I give a brief summary of the conclusions I have arrived at based on the figures given above for the charges incurred from the point of collection to the point of final distribution in years of export.

(1) With the small merchant in the collecting market, the *bania* and *banjara,* I have already dealt. His services or similar services are essential in the early handling of a scattered crop, but there is no reason why he should exploit the cultivator to the extent he does. The only remedy is to get the cultivator out of his hands both with respect to borrowing and to advances for seed. The former can only be achieved by a complete remodelling of the system of rural credit on co-operative lines. The second

is not so difficult, and it is possible that the extension of the seed distribution schemes initiated by the Agricultural Department may achieve this in a reasonable period of time.

(2) The charges (roughly estimated at 3·2 annas per maund) incurred in handling in the larger grain markets preparatory to distribution or putting on rail for export are not excessive. The *arhatia* and the Indian export merchant renders useful service for what appears to me to be a reasonable remuneration. The larger grain markets are well supplied with information regarding price movements. Many of the leading merchants subscribe to Reuter's daily telegrams. There is competition amongst buyers.

(3) The main charge incidental to placing grain f.o.r. at the port of shipment is, of course, railway freight. A reduction in this would be helpful. I have not complete statistics of the movement of railway freights, but doubtless these will be placed before the Commission. The shortage of wagons is a chronic complaint in India, but with this I am unable to deal.

(4) The margin left for the exporting merchants to work within from f.o.r. to f.o.b. at the ports (estimated by me at 8½ annas per maund) is high.

This points at once to need for the provision of improved facilities for handling the wheat crop at the ports. I am not, however, in a position to offer detailed suggestions regarding this.

Raw Sugar.—Raw sugar known, as *gur* and *rab*, is not exported. Price was formerly regulated solely by the condition of the provincial cane crop. In recent years the prejudice against the use of factory-made sugar has disappeared, and the price of *rab*, from which white sugar is made, has been controlled by the Calcutta price of Java sugar. The price of high-class *gur*, a form of sugar only obtainable in India, is still more or less dependent on local production and quality.

I propose first to deal with the marketing of sugarcane in Rohilkhand, where the entire crop is turned into white sugar and molasses by an indigenous process of manufacture. The manufacturer is frequently the village zamindar or the village zamindar in partnership with the sugar broker, locally known as a *khandsari*. The small factory is set up a short distance from the sugarcane fields and the produce is delivered as it is harvested. The system of sale is peculiar to Rohilkhand. Juice is sold by weight; the unit employed is 100 *kutcha* maunds, known as a *cikra* or *karda*. This varies in different places. For the purpose of this discussion it may be taken as 66·52 maunds of 82 2/7 lbs. The method of arriving at the quantity of juice sold is tortuous, but beyond bewidering the young agricultural officer trying to get information, no harm is done. It does not lead to incorrect payments. The whole village community is present to watch the process, and each cultivator knows how much juice he has delivered and been credited with. I give below a translation of a registered contract for the sale of juice between a cultivator and the owners of a small sugar factory (*bel*). The contract is old, but it is the standard form of contract still in use.

"I, Rasul Khan son of Inayat Ullah Khan caste Pathan am a resident of Burhanpur Tehsil Tilhar district Shahjahanpur.

"Whereas I have borrowed Rs.99, half of which is Rs.49.8, from Abdul Qadir Khan son of Ali Ahmad Khan of Shahjahanpur Mohalla Mahmand Hadaf and Qudrat Ullah Khan son of Mindoo Khan of Mohalla Tarin Rangi Choupal out of the Mohallas of Shahjahanpur as an advance (*peshgi*) on sugarcane and have brought into my own use. It is agreed that in lieu of the said sum 300 maunds of juice *katcha* weight without mixing any water, produce of the year 1314 Fasli will be delivered at the rate of Rs.28 per hundred maunds *katcha* weight from the month of *Pus* to the end of *Phagun* of the said year, at the *bel* of village Burhanpur after pressing the same during the day time and filling the *mata* to the brim

and with free bagasse to the owners of the *bel*. If, however, there are rains or the *bel* is out of order, the juice will not be pressed. If however I prepare *gur*, *rab* or sell seed or the juice may be supplied to the said owners in less quantity or not at all, then I shall pay to the said owners damages at the rate of annas two per *katcha* maund. Whatever amount remains due from me will be paid without interest on *chait badi panchami* of the said year.

"If however the money is not paid then I shall pay the sum with interest at the rate of Rs. 2 per mensem from the date of the execution of the bond to the owners of the *bel*. It is further agreed that three big *dolchis* of juice will be given to the said owners as *bel* expenses.

"Therefore this bond has been executed as an authority (agreement)."

The contract shows that the producer deals directly with the manufacturer. The services of intermediaries are dispensed with. The system is not open to objection in theory. In practice, however, the cultivator's need of money at a particular time of year is usually fully exploited. Sugarcane is the cultivator's most valuable crop and he invariably borrows money on it. The manufacturers as a rule advance money in July, August and early September. The condition of the crop is determined by the monsoon and is definitely known by then. Occasionally money is advanced at the time of sowing. When the advance is given a contract is made for supplying juice in the following season (December to March). The cultivator is compelled in order to obtain the advance to accept a lower price for forward sales in August than the estimated price at harvest. In normal seasons the cultivator gets on the average Rs.10 per *cikra* less by forward sales than he would get if he sold his crop at harvest time. Taking Rs.60 per *cikra* as an average price for juice at harvest time the cultivator who takes an advance on his crop in July and August gets in an average season Rs.50 per *cikra*.

The exact meaning of these figures is given below. The average yield of cane is 350 maunds per acre and 55 parts of juice is obtained from 100 parts of cane. The cultivator or zamindar selling juice forward in August and September obtained 6·61 annas per maund for his cane. If he had sold it at harvest rate, he would have obtained 7·94 annas per maund. In other words, he obtained Rs.144·7 per acre instead of Rs.173·4 per acre. I think that there can be no doubt that the financing of the sugarcane crop by means of advances combined with forward sales to zamindars and *khandsaris* results in the cultivator obtaining less than the market value of his most highly priced crop.

There is probably no better instance in the Province of the need for an organised system of co-operative credit. The organisation in Rohilkhand will be a difficult and uphill task. The amount required to finance the sugarcane crop in this tract is a large sum. The area is Rs.3·19 lakhs acres and the value is estimated at Rs.679·5 lakhs. In addition the interests of a powerful body of capitalists are involved.

(1) The abolition of the present system of advances combined with forward sales of juice in August and September, (2) advances to finance the sugarcane crop on reasonable terms, (3) the sale of sugarcane by weight on a basis of sugar content at harvest and, (4) the introduction of power crushing and modern methods of handling the crop are the only methods by which the cultivator can be assured of getting full value for his crop.

The whole industry in Rohilkhand needs reorganisation. The Indian Sugar Committee of which I was a Member examined this problem in detail. A pioneer central factory financed and managed by Government was recommended. The capital required was estimated at Rs.59 lakhs and the amount of cane required was 27·2 lakhs of maunds.

Later examination of the practical difficulties of managing and financing concerns of this magnitude has led me to the conclusion that it would be better to aim at installing a chain of small central factories crushing 60 tons of cane a day. There are many places in the Sarda Canal areas where conditions appear to offer every prospect of success.

Gur.—*Gur* except the amount required for consumption in the villages passes through the large markets. It cannot be handled during the rains. It is a perishable commodity and large quantities cannot be carried over from one season to the next without loss. Prices are therefore subject to marked seasonal variations. It is the cheapest in April and May, the price gradually rising as the season advances. The process of marketing is the same as for wheat. *Gur* is collected in small markets or in villages by *banias* who pay a rate about a seer lower than the rates in the big markets.

The charges for handling in the large market and placing f. o. r. are slightly higher than in the case of wheat owing to the careful handling required.

The total charges on 100 maunds of *gur* are given below:—

	Rs.	*A.*	*P.*
(*a*) *Taula* charges for weighing in the village from *bania* who purchases *gur* at 0-0-3 per rupee from the buyer ...	7	13	0
(*b*) *Tahbazaria* at 0-1-0 per cart from seller	0	5	0
(*c*) Weighing charges at ¼ seer per maund from the seller	3	2	0
(*d*) Charity ¼ seer per maund from the seller	1	9	0
(*e*) To sweeper, *kahar* and *rotkara* at ¼ seer per maund from the seller	3	2	0
(*f*) *Karda* allowance at ½ seer per maund from the seller	6	4	0
(*g*) Commission charges 0-0-3 per rupee from the seller ...	7	13	0
(*h*) Packing charges at Rs.2-0-0 per hundred maund ...	2	0	0
(*i*) Cartage to station from the merchant at Rs.2 per hundred maunds	2	0	0
(*j*) Railway miscellaneous charges at 4 annas per ton ...	0	14	0
Total	34	14	0

Cotton.—The charges in handling raw cotton from the producer to the ginnery are illustrated below by figures collected in the Cawnpore district by the Deputy Director. Let us suppose that the produce of some four cultivators, 100 maunds of raw cotton, is purchased by the village *bania* for Rs.8 per maund. He is almost certain to have made an advance to the cultivators probably up to half the value of the crop say Rs.400. He takes the raw cotton into one of the larger markets and sells it to a cotton dealer for Rs.9 per maund. The *bania* thus makes a profit of Rs.100 on a 100 maunds of raw cotton which cost him Rs.800. Against this he has to pay out

	Rs.	*A.*	*P.*
Interest on Rs.400 advanced to cultivators for 2½ months at Re. 1 per cent. per month	10	0	0
Cartage from the village to the market at Rs.0-2-0 per maund	12	8	0
Handling charges	2	0	0
Watching	1	0	0
Total	25	8	0

The profit on the transaction after allowing for legitimate interest on the advance to cultivators is Rs.74-8 on a capital outlay of Rs.800.

The cotton dealer takes the 100 maunds of cotton to the nearest recognised cotton market. He employs the *arhatia* or commission agent who arranges a sale at current market rates to a cotton ginner, to a wholesale dealer or exporting firm. We can assume for the purposes of this discussion that it

is sold to the ginner at Rs.10 per maund. The small dealer will incur the following charges.

	Rs.	A.	P.
Interest on Rs.1000 at Re. 1 per cent. per mensem for 14 days before it is sold	4	8	0
Brokerage on Rs.1000 at Rs.0-4-0 per cent.	2	8	0
Godown charges	2	0	0
Labour for loading	1	4	0
Cartage (6 carts for 16 miles)	30	0	0
Watching	2	0	0
Karda allowance to buyer at 2½ seers per cart	3	12	0
	46	0	0

The small dealer makes a profit of Rs.54 on 100 maunds of cotton on a capital outlay of Rs.900.

The ginner or export merchant who purchases the raw cotton through his *arhatia* or commission agent incurs the following charges:—

	Rs.	A.	P.
Interest on 1000 at 6 per cent. for 1 month	5	0	0
Pay to the *arhatia* as weighment charges at Rs.2-5-6 per Rs.100	23	7	0
Chabena (allowance to weighmen) at 8 annas per cart ...	3	0	0
Palledari (carrying charges) 3 pies per maund	1	9	0
Charity at 6 pies per Rs.100	0	5	0
Watching and insurance	3	0	0
	36	5	0

100 maunds of raw cotton costs the ginner Rs.1036-5-0 delivered at the ginnery. Rs.236-5-0 has in the form of various middlemen's charges been added to the initial price of Rs.800 paid to the cultivator. The figures given above will of course vary from time to time with the price of raw cotton but they furnish the best record available of the charges involved in handling the cotton crop.

On 100 maunds of raw cotton the itemised charges are as follows:—

	Rs.	A.	P.
Handling charges	4	13	0
Brokerage	2	8	0
Market allowance	6	12	0
Interest	19	8	0
Weighing charges	23	7	0
Charity	0	5	0
Insurance	1	0	0
Cartage	42	8	0
Godown charges	2	0	0
Watching charges	5	0	0
Total	107	13	0

The services rendered by the various intermediaries are given below:—

(1) The *bania* finances the cultivator by advances and as a result it is estimated that he gives the cultivator approximately Rs.2 per maund of *kapas* less than the rates prevailing in the established cotton markets.

(2) The small dealer collects supplies from the small village *banias* and transports them to the established cotton markets.

(3) The *arhatia* acts as a commission agent between the dealer and the ginner.

Mr. G. Clarke.

The establishment in the United Provinces of special cotton markets on the Berar system has been fully investigated at the suggestion of the Indian Cotton Committee (*vide* page 205 of their report.) The Indian Cotton Committee arrived at the tentative conclusion that the area was too scattered at present to justify the establishment of separate markets. It was found on further enquiry that legislation would be necessary in the United Provinces. This Government consulted its expert committees. Their opinion was not favourable to the establishment of markets on the model of the Berar Cotton Markets and they did not consider that legislation on the lines of the Berar Cotton and Grain Markets Law was desirable. Government accepted this advice as indeed it was bound to do. The expert committees contained a large number of Members of the Legislative Council and any Act introduced in the face of such general opposition would have been thrown out.

The Industries Department attempted to establish an experimental market in Hathras but failed as it was found impossible to enforce the rules without legislation. I am inclined to take the view that the advice given to Government by the expert committees was sound in view of the special conditions in the United Provinces. Our cotton area is small and our season is very short, consequently there are no regular cotton markets in existence. In Berar and Bombay big markets have been in existence for a number of years and are easy to regulate. In Cawnpore and to a certain extent in Aligarh, cotton is bought and sold at special places in the market but this is a very different thing from the big separate markets of Berar.

My opinion is that regulations necessary to control the cotton markets can only be satisfactorily worked when a huge crop is dealt with which comes steadily into the market throughout the season. Our crop as I have stated is not a large crop, the seasons are short. There are a number of relatively small markets. If we tried to draw four walls round a limited number of shops dealing in cotton and called the inner space a market and imposed a number of somewhat onerous restrictions, the trade would simply go elsewhere.

The question of obtaining full value for a superior variety of cotton during the early stages of its introduction is still unsolved and is one of our greatest difficulties. As far as I can see, there is no alternative at present to Government purchase in the early stages although I regard this as very unsatisfactory.

QUESTION 22.—CO-OPERATION.—My considered opinion is that the Co-operative Department in these Provinces can best help agriculture by putting rural credit societies on a sounder basis. Until this is done, little progress can be expected as regards other forms of co-operation. The examination of many phases of agricultural development shows that progress is held back at every turn by the ignorance and indebtedness of the cultivator. In the sale of his produce, particularly his sugarcane crop in Rohilkhand, he is handicapped by debt.

The co-operative organisation of agriculture presents great possibilities. All who have examined the question in India admit that, but first of all rural credit societies must be increased and public confidence in them restored.

At the present time there is no demand in these Provinces for agricultural non-credit societies. The Co-operative and Agricultural Departments have tried to establish societies for seed distribution and for the management of tube wells. Year after year they are reported to be doing little or nothing. The demand for such societies has yet to be created. After years of failure a sudden outburst of successful activity is not to be looked for, and for some time the Agricultural Department will be unable to rely on co-operation to replace any of its activities.

I appreciate the fact that a start must be made. There are a number of improvements successfully initiated by the Agricultural Department which are suitable for working on co-operative lines. It is just as easy for the

department to assist properly organised societies as it is to assist individuals. I give below some of our activities which are suitable for co-operative organisation :—

(1) Production and sale of improved seed.
(2) Purchase and sale of agricultural implements.
(3) Installation of small power sugarcane mills.
(4) Threshing of *rabi* crops by modern machinery.
(5) Irrigation by means of tube wells and pumping plant.
(6) The organisation of village milk collection schemes for supplying city markets.
(7) Well boring operations for the improvements of masonry wells.

Before societies are started, detailed schemes should be prepared by the Co-operative Department and placed before the Board of Agriculture for consideration. This is important because, I think, that our failures in the past have been in part due to insufficient consideration of the details of the schemes initiated.

QUESTION 26.—STATISTICS.—The information collected regarding area of crops in the United Provinces is accurate. The estimate of yield which is based on crop cutting experiments is fairly accurate. A very much larger number of these is required if a higher standard of accuracy is to be obtained in the five-yearly revisions of outturn. I consider that a special staff should be attached to the land records section for this purpose with a definite programme settled in consultation by the two Directors of Land Records and Agriculture. It is not fair to ask the technical officers of the Agricultural Department who are already overworked to undertake a large programme of crop cutting experiments. The work does not require a great deal of technical knowledge.

The absence of complete crop cutting tests is felt whenever the Government of India call for a return of the total outturn of another crop. For example, returns have recently been asked for the tobacco crop and the castor seed crop. Neither of these could be supplied in the absence of a series of accurate crop cutting tests.

The publication of crop forecasts is done by the Director of Agriculture. The information is collected and the draft forecasts are prepared in the Land Records Department which contains the necessary organisation. I do not consider this entirely satisfactory. I should prefer to see the whole of the forecasts carried out by a statistical officer attached to the Land Records Department who in addition to this would supervise the preparation and publication of all agricultural statistics, organise crop cutting tests and conduct such economic inquiries as may be called for.

The general position regarding agricultural statistics in the United Provinces is this. A large volume of accurate information extending over a long series of years is in existence and forms valuable material for the study of many economic problems of the Province. No arrangements exist for systematic examination. I regard the appointment of an expert statistical officer with an adequate staff (the nucleus for which exists in the statistical section of the Land Records Department) as a matter of urgent necessity. As I have already stated, it is unlikely that the Council will view sympathetically proposals for the appointment of a statistical officer. The work is largely for All-India requirements. I consider that the Government of India should undertake the financing of statistical sections for all Provinces.

A further suggestion I wish to make is that the returns of areas under improved crops introduced by the Agricultural Department should be made regularly by the patwari at the time of preparing the *jinswars*. This has already been done in four or five districts without any increase in staff and provides the Agricultural Department with valuable information.

APPENDIX.

PARAGRAPH 175 OF THE REPORT ON AGRICULTURE IN THE UNITED PROVINCES.

The Hardoi district is a good example of co-ordinated effort between different sections of the Agricultural Department, assisted by non-official agency. The demonstration farm, managed by the department and financed by the district board, and the agricultural supply society, a purely unofficial organisation, started the development of this district; the farm has shown a good profit for many years. Conditions in Hardoi proved excellent for the construction of tube-wells, and the engineering section completed eleven wells with discharges varying from 20,000 to 30,000 gallons per hour. The next stage was the establishment of private farms by many of the leading land-owners, with the advice and assistance of officers of the department. The conclusion at this very time of a series of experiments at the Shahjahanpur research station placed in the hands of the cultivator a variety of sugarcane and a method of cultivation giving yields two to two and a half times greater than those obtained by indigenous varieties and ordinary methods, and the new variety and methods were tried with success on the Hardoi farm. Circle officers organized demonstrations on private farms and cultivator's fields, and the response was immediate. In the cold weather of 1925 intensely cultivated areas were to be seen on private farms, on land surrounding tube-wells, and on cultivator's own fields. Magnificent crops of Java sugarcane and of Pusa wheat showed the possibilities of scientific agriculture in this province, and the profits of the owners of farms were equally convincing.

Oral Evidence.

33,559. *The Chairman:* Mr. Clarke, you are Director of Agriculture in the United Provinces?—Yes.

33,560. You have provided the Royal Commission with a note of the evidence that you wish to give. Would you like at this stage to make any statement in amplication of that note?—No.

33,561. Would you kindly give us first an account of your own training and past appointments?—I was trained at University College, Nottingham; afterwards I was a lecturer at Manchester University; after that I was head of what were the County Technical Laboratories, Chelmsford, which are now the East Anglian Institute of Agriculture; and 20 years ago I joined the Agricultural Department of the United Provinces.

33,562. For how long have you been Director?—Since 1921.

33,563. Would you give us a sketch of the organisation of your department both at headquarters and in the districts, mentioning the grade of officers holding the various posts? There is first yourself as Director?—There are six circles, each presided over by a Deputy Director; each of those circles has a self-contained staff for the management of experimental and demonstration farms, seed distribution and demonstration. In addition to that, there are separate sections for agricultural engineering and cattle breeding which also have self-contained staffs.

33,564. The cattle breeding section is under another Deputy Director?—Yes.

33,565. And the agricultural engineering section?—That is under an Agricultural Engineer. In addition to that, there are the educational institutions: the Agricultural College, Cawnpore, which is a combined educational and research institution, and the Agricultural School at Bulandshahr which is wholly an educational institution.

33,566. You have no Deputy Director who is not specially attached to some particular department; all your Deputy Directors are definitely attached to particular departments?—I have no Assistant Director; in the organisation at headquarters there is myself; that is the organisation of the districts and the experimental work generally; but with regard to the organisation of administration there is myself, a per-

sonal assistant, two accounts officers, and a staff of clerks. I have no technical assistants in the administration.

33,567. Could you tell us with a little more particularity the organisation within the circle? There is the Deputy Director at the head of the circle? —Yes. Immediately under him are the United Provinces Agricultural Service officers, one or two in each circle.

33,568. Then the demonstration staff?—Under them the demonstration staff and the managers of farms and so forth.

33,569. Have the members of your demonstration staff been trained at the Agricultural College?—Yes, almost without exception; there are a few exceptions, but it is almost without exception.

33,570. Have you a record office under you?—Do you mean land records?

33,571. No, I mean an office engaged in recording experiments and experiences; for instance, if you are making an attempt to popularise the silo, what steps are taken to ensure that all the experience that you glean should be available in the future, either for yourself or for some successor?—The medium for that is the circle reports, the reports of the experimental and demonstration farms which are issued for each circle and the annual demonstration reports. The information is gathered in my office for the annual demonstration reports; that is the only record.

33,572. I am sure you will agree with me that it is very important that records of that sort should be kept, and particularly records of unsuccessful experiments?—Yes; they are kept, not in my office, but in the offices of the Deputy Directors concerned.

33,573. *Professor Gangulee:* Even the records of unsuccessful experiments?—Of course, yes, all records.

33,574. *The Chairman:* Are you recruiting yet for the new Superior Provincial Service?—No.

33,575. What are your plans?—We have none at present.

33,576. What is the policy of Government in that direction?—We are waiting for definite orders from the Government of India; we have been told to stop recruiting for the higher posts; we are not allowed to recruit for the Imperial Agricultural Service, nor are we allowed to promote our Provincial Service officers to the Imperial Service at present.

33,577. When did that instruction come in?—I cannot tell you the exact date, but it is recently, within a year or so. What I want to say is that we are not allowed to place our United Provinces Agricultural Service officers in the Indian Agricultural Service.

33,578. But what I was concerned with was the recruiting for the new Superior Provincial Service in accordance with the recommendations of the Commission over which Lord Lee presided?—It has not been constituted in this Province yet.

33,579. But it is not as regards the constitution of that service that any instructions have come from the Government of India?—I am not an authority on procedure, but I understand the limitations of pay are Rs. 1,200, and we cannot exceed that. I know the rules delegating powers to Local Governments are under re-consideration.

33,580. Then I judge from a later section of your note that you rather look forward to a day when some central educational institution should provide the post-graduate training for officers of the Superior Provincial Service?—Of the upper grade Provincial Service.

33,581. You rather feel, I gather, that that would be a more useful function for Pusa to perform than would be any service in the direction of research?—I consider that the most essential thing required at the moment is the provision of training for Deputy Directors in particular.

33,582. You say on page 13 of your note: "I advocate the development of Pusa as a purely teaching institution." In the natural course of events it seems clear that the main lines of research will have to be removed to

provincial centres whatever course may be adopted with regard to their control whether it be provincial or central." Do you contemplate the complete divorce of teaching from research?—No, not the complete divorce.

33,583. You attach importance to teaching and research being carried on in conjunction?—Yes, but not the extensive research which is required for the whole of India. It cannot be carried on at an institution which is also a teaching institution. For instance, I do not think you could do the work which is being done at the Central Institute in conjunction with the teaching institution, nor do I think the work at Coimbatore can be done in conjunction with the teaching institution.

33,584. Then you say the research activities of Pusa are bound to decline. In that connection, I should like to ask you what is your view about the services Pusa has rendered and can render in future as a Central Research Institute?—I have stated what they have rendered; I think I have made that quite clear. I do not think that the result of the research work carried out at Pusa, except as regards the improvement of wheat, has had any effect on the agricultural development of these Provinces.

33,585. Do you not think that a central research station can usefully concern itself with problems of a fundamental nature and of general application, problems of soil chemistry, for instance?—Yes, a limited number of problems.

33,586. Is it your view that Pusa is being conducted on too ambitious a scale at this moment?—Do you mean with regard to research work?

33,587. I do?—No.

33,588. You are anxious to see that where extension takes place it should take place in the Provinces?—That is my idea.

33,589. "Research activities at Pusa are bound to decline," you say. Are you familiar with the history of the Central Department of Agriculture in the United States of America?—I suppose I am as familiar as any foreigner is.

33,590. That is a very active and powerful organisation, is it not?—Yes. I do not possess sufficient knowledge to discuss the thing from that angle.

33,591. Now to turn to the commencement of your note again. In the second paragraph you say: "I have no hesitation in saying that it is as easy to get money voted for research in these Provinces as it is in England, if the problems have a direct bearing on provincial agriculture." Does that mean that it is reasonably easy to get money voted for research in this Province?—I can perhaps answer that question best by quoting from a speech I made in the Legislative Council the day before yesterday: "The budget of the Agricultural Department for 1926-27 was 24·4 lakhs; the Budget for 1916-17 was 6·8 lakhs. In ten years our Budget has increased by three and a half times. I think this will satisfy the House that agriculture has not been neglected either by Government or by the Legislative Council since my department became dependent on the vote of the Council for its supplies." Judging from the point of view of financial provision, progress has been remarkable.

33,592. Mr. Parr, who has been good enough to provide us with a note of the evidence which he wishes to give, says: "More men and money are needed in order to expand the Agricultural Department to enable it to cope to an appreciable extent with the task before it. At present it occupies a position of secondary importance in the eyes of Government . . .". Mr. Parr appears there to be a little less optimistic than yourself?—If I can make a claim to anything I make a claim to having a very wide experience of this kind of Government which has been in existence now for six years.

33,593. It is your view, I understand, that on the whole the tendency of the Reforms has been to quicken public interest?—Undoubtedly. I have no doubt whatever on that point.

33,594. And on the whole criticism in the Legislature has been helpful?—Yes, and it has now become constructive. It is tiresome, no doubt, but of that I make no complaint.

33,595. All Parliamentary criticism is, but on the whole it acts for good?—Yes.

33,596. You are not a Secretary to Government, are you?—No.

33,597. On page 2 you say: "Removal of responsibility for the investigation of the fundamental problems of agriculture from the Council would, in my opinion, have a deadening effect on provincial development." I wonder whether anybody had suggested anything of that sort?—It occurred to me that it would be a likely thing to suggest. In fact it was first conveyed to my mind by some notes which came into my hands from the Agricultural Adviser.

33,598. The Agricultural Adviser must, of course, speak for himself, but I am sure that when you come to know the Commission a little more, you will not suspect us of any such design?—The real view was that the organisation of research on central lines and not on provincial lines would remove responsibility for the investigation of fundamental problems of agriculture from the Council.

33,599. Since you have recorded that view, I would like to ask you whether you think that in the immediate future it is probable that each Province could afford to pay the very highest class of research worker in all branches?—Yes, I think they could. It would be a gradual process, but I think that is the thing to be aimed at. I think they are just as likely to do it as any organisation in India would be.

33,600. To attract and retain the services of men of world-wide reputation?—Yes. There is no reason to suppose that the Provincial Council would be less likely to do it than the Imperial Legislature.

33,601. Do you think that they could provide a sufficient salary for each of them?—I have suggested how they could be assisted to achieve this end later on, but I think there is no reason to suppose that it could not be done.

33,602. You think also that they could provide the security necessary to attract the type of man which you and I are thinking of?—Yes, I can only repeat what I said just now that there is no reason to suppose that the Provincial Council is less likely than the Imperial Legislature to do it.

33,603. On page 6, Question 1, you suggest that the problem of nitrogen fixation by the cyanamide and other processes should be investigated? That is the sort of research which you suggest the Central Government should be responsible for?—Yes, that is a suitable thing for an All-India investigation.

33,604. And that, I think you will agree, would require a man of first class capacity?—Yes, but it is, if I may use the expression, a short-term research which would last, say, for four or five years. It is not going to be anything like the fundamental researches into the agricultural conditions of the Province which would last for twenty years.

33,605. What is your view as regards the touch between Province and Province? Do you think you are getting all the information that you would like from other Provinces?—Yes. I have no reason to think that we are not getting any information that is going round.

33,606. Do you feel, on the point of co-ordination, that any further degree of touch between Province and Province might result in an increase in efficiency and research and a decrease in expenditure?—Co-ordination is no doubt desirable to a certain extent. It is really the way in which it is done that matters. But I am inclined to the view that the beneficial results to be obtained by an elaborate organisation for co-ordination are somewhat over-estimated. Again, I have gathered the idea from reading various notes and minutes that have come into my hands that a small

Imperial staff of a limited size working as a team can do all that is required. That is the idea I have gathered, but that is not enough. What we want in India is many teams. And it seems to me that merely to apply to a continent like India a principle which works for a very small country like Denmark is wrong.

33,607. If further co-ordination up to a point is in your view desirable, how do you suggest that that should be obtained?—I think it will best be obtained, in fact the only way to obtain it, is by a small permanent staff of Development Commissioners or Agricultural Commissioners under the Government of India. I am not in favour of an advisory committee. If you want co-ordination, what you want is a small permanent body of Agricultural Commissioners or Development Commissioners to co-ordinate the work. Advisory Committees do not work in India. The distance is too great. I have myself been a member of the Indian Central Cotton Committee since its inception, and I have never yet been able to attend the meetings. I have not been permitted to do so.

33,608. *Sir Henry Lawrence*: Permitted by whom?—By my duties. The last meeting was on the 24th, and the Council was sitting at that time, and it was impossible to leave.

33,609. *The Chairman*: Taking up your own idea of a Central Development Commission, whence do you think such a Commission might draw its authority? From the prestige of its members or from some funds at their disposal?—I think I have dealt with that in my answers to the various questions.

33,610. I thought you would be able to condense that in answer to my question?—I can only repeat what I have said in my note. I have dealt with it pretty fully in answer to Question I (*b*), and I have also dealt with it in answer to the question on Administration. I can only develop what I have already said there.

33,611. I understand from what you have written, you think that it is essential that such a Central Development Commission should have certain funds at its disposal?—My idea is that the Government of India should help, and I understand they are desirous of helping. If that is so, I hold very strongly the view that they should help schemes which the Minister has approved and placed before the Legislative Council.

33,612. Do you think it would be reasonable for your Central Development Commission, when they were considering a scheme which had been put up by a Provincial Government, to suggest to such Provincial Government that a part of their scheme was really a problem that was already being dealt with by some other Province and to invite the Province making the application to agree to leave that particular section of the problem to the other Province?—It will be quite open for them to do so, and if the Province were unwilling to do that, and a grant was in consequence refused, no one could object.

33,613. There would be no interference?—That would not be the type of interference that I am referring to. It is quite open to the Government through their properly constituted authorities to say, "We will not give you the grant."

33,614. Taking another possibility, do you think it would be reasonable if the Central Development Commission said to the Provincial Government, "We have looked into this scheme, and provided you agree to one or two points, we will give you a grant representing such and such percentage of the total expenditure year by year for five years. But we will re-examine the problem again in two years' time, and satisfy ourselves that you have followed our advice"?—Certainly, there can be no objection whatever to the proposal. It is just as much within the powers of the Local Government to say, "We decline to accept your offer; we will get the money

from our own Legislature." The main point of my idea is that the Provincial Legislature is the final authority for deciding what shall, or shall not, be done in the Province for development of all kinds; that is the central part of my scheme.

33,615. Is it not then really the case that any scheme which does not satisfy the Provincial Government is doomed to failure from the start?—May I just elaborate it a little bit more? Supposing that you set up a central organisation with research stations in the Provinces, as was proposed in a note which came into my hands, nothing in the suggestion could prevent the local Legislature from entertaining a research staff if they wished to do so, and that they would do so I have not the slightest doubt, and therefore you would have two bodies at the same time. Government would be powerless to stop it. They will have their own provincial research organisation, and there will be the Imperial research organisation, and you will get exactly what you are getting now with Pusa and the Provinces, excepting you spread Pusa about; that is all.

33,616. That might conceivably involve waste of funds and effort?—Yes.

33,617. But even that would not involve interference with the administration of the Provincial Departments of Agriculture or of the field of provincial administration, would it?—It would simply be, taking India as a whole, a waste.

33,618. Before we leave that subject I should like to ask you whether you have formed any views about the working of the Indian Central Cotton Committee. That is typical of the organisation of research by crops and not by areas, is it not? Would you like to tell us anything about that?—This Cotton Committee for financing research is still in the experimental stage and it remains yet to be seen whether it will lead to fruitful results or not. They have only initiated a lot of schemes, and, beyond restrictive legislative, that is about all that has been done. They have prepared a scheme in the United Provinces, and we would have proceeded just in the same way even without that; and there are certain complications which have already arisen. For instance, they insist on the money which they grant being treated as an excluded fund; that is to say, it does not pass through the provincial accounts, and this expenditure is not submitted to the Legislative Council although it is part of a scheme for which they are providing about 80 per cent. That in itself, I think, is wrong.

33,619. *Sir Henry Lawrence*: What percentage?—I am not quite sure about it, but I should say it is about 80 per cent.

33,620. *The Chairman*: From public revenues?—Yes. To be perfectly on the safe side, I will say 60 per cent.; it does not affect my argument. This is a scheme of research for which the Provinces are contributing about 60 per cent., and they wish to go on with that scheme, but they do not wish the expenditure which they have provided to be criticised or to go in any way before the Legislative Council; that in itself is wrong in principle and likely to land us into trouble.

33,621. *Sir Henry Lawrence*: That 60 per cent. is placed at the disposal of the Central Cotton Committee, is it?—No. We are carrying out a scheme in the United Provinces which is costing a certain sum of money. Sixty per cent. or more of that is in the provincial budget; the remaining amount is contributed by the Provincial Cotton Committee.

33,622. *Sir James MacKenna*: Has that scheme been originated by the Local Government or by the Central Cotton Committee?—The scheme has been originated by the Local Government.

33,623. What is the complaint?—There is no complaint. The point is that I consider the Council should know how much money is being taken year by year for the scheme and they should be able to see what assistance

they are getting from outside. The whole thing should go before them; otherwise I think it is a mistake and it will tend to make the Council hostile.

33,624. *The Chairman*: The control of the Council over the spending of the money that the Council provides out of public revenues is not in question?—No.

33,625. *Professor Gangulee*: Has that scheme been already taken up?—It is in progress; there is a discussion about that; it has not yet been definitely settled.

33,626. *Sir Henry Lawrence*: What is approximately the sum so far spent on these cotton experiments? Is it a large sum?—Yes, it is a large sum; I should think it is roughly about Rs.80,000.

33,627. *The Chairman*: At the top of page 3 in answer to Question 1 you say: "It seems to me, therefore, that if the Government of India desires to advance the agricultural development of the Province it should be prepared to assist the Local Government with their agricultural budgets when they are unable to present full demands for research work to the Council owing to financial stringency or any other cause." That suggestion, I suppose, is part of the suggestion which we discussed a moment ago that such funds should be definitely allocated to particular purposes?—I did really intend to raise another question that in the case of the Provinces having deficit budgets they should be supplemented.

33,628. Your suggestion is that the Government of India fund should be provided without being hypothecated to any particular subject?—That is rather what I wanted to suggest; and that in extreme cases, not as a general rule.

33,629. On page 3, Question 1, you tell us that you are not quite satisfied with the progress that you are making in research in certain directions. You say: "We have at the present time young officers working on rice, cotton, barley, oil seeds and fibre crops and potatoes." Are these officers Indian or European?—Indian.

33,630. Does that suggest to you that the research officers that you are getting have not been trained in the right way?—No; it merely suggests to me that we are putting young officers on to tackle a problem when they are too inexperienced.

33,631. Have they had the post-graduate training required?—I think, with one exception, they have had post-graduate training, although I think most of them will not be able to tackle those problems without detailed expert guidance. It would be like taking a lot of boys fresh from college and putting them on some of the most difficult problems in the world and expecting them to solve them. It is really absurd.

33,632. Do you think you can get in India the necessary lead?—I doubt it I am afraid we should have to go to America probably to get it. I do not think you will get it from England.

33,633. You would include England in your search?—Yes, I would include the world.

33,634. Do you think you could carry public opinion and opinion in the Council in making appointments of that sort?—That is very uncertain, I think. At the present moment I can, but one can never tell what view may be taken.

33,635. But it is a very important line of work?—It is very important.

33,636. I suppose there is no feeling at the back of your mind that this paragraph in your note of evidence reinforces the case for a central organisation capable of directing the best type of research worker?—Exactly the same argument applies to it.

33,637. Turning to your answer on page 6 to Question 1, "Research into the expenditure of irrigation water," I want to be quite certain as to the position of the responsibility as between your department and the Irrigation Department. Is it the case that, at the moment, well irrigation is entirely under you?—Yes, wholly; that is to say, the development of it.

33,638. On its technical side as well?—Yes.

33,639. Is that a good plan, in your judgment?—Yes, I think it is working very well.

33,640. Would you rather keep that than see the responsibility passed on to the Irrigation Department?—Yes; on the whole, I think I would, because it is very intimately connected with the introduction of intensive agriculture.

33,641. Question 2, Agricultural Education: in the second last paragraph, you are talking of the relation between primary education and agricultural advance. Would you agree that literacy amongst a higher proportion of cultivators is a great desideratum?—Yes. My personal experience is that when you are demonstrating or introducing anything, it is the educated boy who always comes to the front.

33,642. Do you think there is some danger that the desire to introduce what is called an agricultural bias into primary education may, to some extent, interfere with the work of equipping the primary school children with literacy, the three R's?—I am inclined to think that the whole attention should be devoted to literacy.

33,643. They can learn the business of agriculture a little later?—They know it already, as much as they can know at that age. There is no child in the countryside without a knowledge of these things.

33,644. Taking the points in the order of your note; first, about the Bulandshahr school scheme which is described in the course of the provincial memorandum entitled "Report on Agriculture in the United Provinces,"* which was prepared for the Commission some months ago, I should like to ask you on that: are accurate records of the after careers of the boys being kept?—We have only had two classes passed out.

33,645. So that it is just beginning?—Yes.

33,646. Do you attach great importance to the keeping of accurate records of the after careers of the boys?—Yes, as far as it is possible to maintain them.

33,647. In the last but one paragraph on page 8, in answer to Question 2, you give us the total cost of the Bulandshahr school on its non-recurring side as Rs. 2·75 lakhs, and the recurring expenditure as about Rs.29,000. What do you gauge as the cost per student?—It can be obtained by calculation. There are 49 students.

33,648. Do you know how that compares with the cost of similar institutions in other Provinces?—I think there are no similar institutions in other Provinces.

33,649. How does it compare with the Loni school?—I should say that the Loni school is not like it. It is not well equipped, and is not of such a high standard.

33,650. *Dr. Hyder:* You have been to Loni?—No, but I know the details about the age of the boys, &c.

33,651. And the equipment?—Yes, and the equipment; it is not of such a high standard.

33,652. You have not seen it?—I have not seen it. I base my remarks on what I have been told about it by its founder.

33,653. *The Chairman:* At a cost of something over Rs.500, I take it that it is only the boy of commanding position in life or special capacity who is worth that money?—I should be very sorry to say so.

* Not printed.

33,654. On the technical side, do you contemplate the extension of schools on a system of this sort?—Yes, to deal with these particular boys.

33,655. Why these particular boys?—They are the sons of the larger tenants or the smaller zamindars.

33,656. Are they in a special position?—Yes.

33,657. Do any of the boys who pass from the Bulandshahr school have the advantage of a higher system of education?—No.

33,658. Is there any English at all?—Very little; not sufficient to qualify them for the University course.

33,659. Do you feel yourself that the fact that the boy cannot go on lessens the attraction of the school?—It lessens the attraction of the school to a certain number, of course.

33,660. But not to the type that you want?—Not to the type we want.

33,661. I do not know whether we have been provided with the figures of the wastage between the bottom and the top of that school. Could you give us any indication as to what are the figures of wastage?—I do not think that those figures have been provided. I cannot give exact figures, but I think it is very little; probably three or four drop out during the course.

33,662. Would you let us have figures as to the number of boys who enter and the number of boys who leave, class by class?—Yes, certainly.

33,663. So far as you know, that has not been a serious problem?—No, certainly not.

33,664. How old are the boys when they join?—They are rather old; from 16 to 17; they are getting a little younger now. The average age is 19.

33,665. Are the teachers at this school graduates of your Agricultural College?—Yes. A few special teachers, such as for book-keeping and engineering, are not graduates of the Agricultural College, but the others are.

33,666. How about the teachers in the vernacular middle schools in which agricultural training is given?—They are trained at the Bulandshahr school.

33,667. Do you think there is room for an expansion of the vernacular middle school, with agricultural training and also special English, if anybody wishes to take it to make it possible for him to go to the high school?—Are you talking about agricultural education in vernacular middle schools as part of the school curriculum?

33,668. Yes?—I think there is undoubtedly both the desire and the need for an extension of that.

33,669. Is that rather the direction in which you would expect popular demand among the mass of the cultivators to move in the future?—Very few cultivators care for that. I am not an expert on education, but I do not think there are many cultivators who get to these vernacular middle schools. The plan is that they leave the primary school at class II.

33,670. On page 10 of your answer to Question 2, I see that you grant degrees?—It is not a degree; it is a diploma.

33,671. There is no actual link with the University?—No.

33,672. Do you think it might be well if you could grant a degree?—I think it would be well to be affiliated to a University. We have had committees of various sorts on it, and I think it would be an advantage, and I also think it will come. The situation has changed.

33,673. Is there any difficulty?—The only difficulty was that in the United Provinces there was no University to which to affiliate the college. All the Universities have been teaching Universities.

33,674. It does not matter much whether the University is near at hand, or far away?—There was no University in these Provinces to affiliate it to. Now they are going to have one, and the agricultural college will be affiliated to it. Allahabad, Lucknow, and Benares are not affiliating Universities.

33,675. It is not essential that the University should be in the Provinces, although it is desirable?—No; it might be London.

33,676. On page 10 of your answer to Question 2, you say: "In my opinion it would all be to the good if a larger proportion of these had a training such as given at the Agricultural College." Have you ever thought over the possibility of instituting a degree of Rural Economics in the Universities?—I have not; it has never come up, but I take it that a degree in Rural Economics would be very similar to our degree in Agriculture.

33,677. Except that one envisages such a degree course as being in rural economics in the broadest sense?—Yes, it would be a very good development.

33,678. *Professor Gangulee*: Do you teach agricultural economics in the Agricultural College?—Yes, not very well or very deeply; there is no Professor of Agricultural Economics. The merest study of agriculture must involve the study of some kind of economics.

33,679. *The Chairman*: In answer to Question 3 on demonstration and propaganda, you give us a very complete and interesting account of the development on this particular side of your work in the Province. Do you find there is a growing demand from cultivators for help and advice?—Yes, undoubtedly.

33,680. Do you think that is growing pretty quickly?—Undoubtedly. The great danger is in giving out something that is not good enough; more harm can be done by inexperienced demonstration than by anything in the world.

33,681. Do you think there is work to be done in the direction of accurate costing of farming operations on units typical of the holdings held by cultivators?—Yes; it is very difficult, but it is really a necessity; we are trying to introduce it into the farms first of all; we find some difficulty in doing it there, but we are trying to do that already, and of course we shall extend it. We want to extend it; it is of course a secondary essential.

33,682. Are you attempting demonstration by means of persuading a cultivator to undertake a particular experiment at your risk, as it were?—No, we are not; our general line is to hire a piece of land and to do it well in front of the cultivator. To anybody acquainted with India the other method opens up such vast fields that I do not think it would be wise.

33,683. That is what I expected you to say; the difficulties of assessing the position afterwards would be almost insuperable?—Yes. We have done it to a certain extent on *batai*, which is something of the same kind, but I should not like to set out on a demonstration in which we should say, "We will make up for you what you think you ought to have got."

33,684. It might be rather a premium on failure. On Question 4, page 17, you point out that the total expenditure of the Central Government on the Pusa Institute is 8·36 lakhs. I wanted to be certain what was in your mind there. You regard that as a very small sum?—I do not say it is a small sum to spend on Pusa, but what I say is it is a small contribution to agricultural research.

33,685. As you point out, that does not, of course, include the veterinary side, nor I think does it include the cost of the special work at Coimbatore?—I am not sure, but I think it does.

33,686. Then perhaps I am wrong there. On Question 7, Fragmentation of Holdings: is undue fragmentation, the result of sub-division, a burning problem in this Province?—I do not think fragmentation as understood here is a very burning problem, but I should think a very important problem is the decrease in the size of holdings.

33,687. That is difficult to avoid under the present system of inheritance. You would distinguish between fragmentation and sub-division, of course?—

It varies greatly in different parts of the Province, but, as I say, it is there, and we manage to get over it somehow or other; it is not so great an evil as is, I think, generally supposed.

33,688. *Dr. Hyder*: Have you got any statistical information on which you are basing these statements?—No, these are the results of my own personal observations; they are not based on strict statistical examination, and before I express a strong opinion I should want to see the economics of a fragmented and consolidated holding worked out; I do not see how otherwise you could arrive at any conclusion.

33,689. And that has not been worked out?—No, that has not been worked out.

33,690. *The Chairman*: Has there been any survey conducted in any part of the Province to discover what is in fact the size of the holdings?—Yes. I cannot give you very full information with regard to these matters, which are of a semi-revenue character, but I think you will find all the information supplied in the last chapter of the Report.

33,691. All the information that is available?—Yes. I am not an authority on revenue matters; I can only give very limited information, mostly based on personal observations.

33,692. On Question 8, Irrigation, are you satisfied that there is a sufficiently close touch and understanding between your own department and the Irrigation Department?—Yes.

33,693. You told the Commission some moments ago that you were responsible for well irrigation up to a point; do you carry your advice in that matter into the problem of the actual lift, the apparatus for lifting the water out of the well?—Yes, of course; that comes into the construction of power pumping plant; it is considered in every estimate that is given for a power pumping plant.

33,694. What is the view of your department on that point in relation to the small well?—Do you mean the well of small discharge?

33,695. Yes. Are you working out any particular class of lift here? Is it mostly by bullock power that water is being lifted?—From the small well by Persian wheel and bullocks, and from the tube well, of course, by power pumping plant.

33,696. Is it your view that there is a field for research in that direction? —Yes. I should say it is not one of the most pressing problems; I do not know whether anything will be found very much cheaper.

33,696A. Do you think there is much opening in this Province for minor irrigation schemes such as the damming of streams or the construction of small tanks?—Yes; it is very limited; there is very little water left anywhere, I understand. Small pumping schemes can be made; we have in various parts bunded up small streams and made small pumping schemes, but they are very limited.

33,697. The subsoil water is the best source?—The subsoil water is the best unexploited source.

33,698. Do you cover the ordinary village drinking water well in your responsibility?—No; many of the wells are used for drinking, but that is the sphere of the well-boring section of the Public Health Department.

33,699. We are debarred by our terms of reference from inquiring into the charges for water, but is there anything you would like to say about the method of charge?—For canal irrigation?

33,700. Yes?—No, I do not wish to say anything.

33,701. From your answer to Question 8, I understand that Government subsidise the construction of tube wells and pumping plant to the extent of

Rs. 6,000 per well; I suppose that is worked out on an average?—Yes, it is an approximate figure, of course, but the overhead charges last year came to Rs. 4,987.

33,702. But are the wells so subsidised the 673 and 510 wells mentioned on page 19?—No, those are different sorts of wells; those are tube wells.

33,703. You say: "The total borings made were 673, out of which 510 were successful." None of those are tube wells?—No.

33,704. I am interested in what you say on page 21 in answer to Question 8; you point out that well irrigation is really not a business proposition unless you go in for intensive cultivation. Do you know the net return in profit per acre which is requfred to finance the ordinary well? Quite obviously it depends upon the water discharge in relation to the cost of the well, and so on; but have you any general figure?—No, we have not got sufficiently accurate figures to bring forward; we are getting them.

33,705. That will be an important and interesting line of research?—Yes.

33,706. What is the source of power in this group of wells mentioned in the last paragraph but one?—It is to be electric. Do you mean the actual source of power?

33,707. Yes, the prime mover?—Oil.

33,708. On Question 9 as to wells, I think you are building up something in the nature of a record of soil analysis?—Yes, we have got the records.

33,709. Would you attach importance to an organised soil survey?—No.

33,710. On Question 10, Fertilisers, what is the limiting factor in this Province?—Ignorance of their use I should think.

33,711. Not a particular deficiency?—No.

33,712. What is the particular deficiency in soil in this Province?—Nitrogen and phosphorus.

33,713. Is the phosphate deficiency general?—It is universal. There is a phosphate deficiency all over India. The foods are deficient in phosphates, the children are deficient in phosphates. It is one of the ills of India.

33,714. On the question of preventing the fraudulent adulteration of fertilisers, you are concerned to see that the chemical substances imported and sold as manure are of standard quality. Have you any facts that you can put before the Commission on this question?—I have every reason to believe that nothing has been imported, but if a large trade develops it is very likely that it would be done.

33,715. *Professor Gangulee*: These fertilisers are sold on a unit basis?—Yes.

33,716. *The Chairman*: With regard to this question of seed distribution, Question 11, you find the Co-operative Department very ready to help you, do you?—They are ready, but their efforts have not been very successful at present because they have no organisation and they have not undertaken the production and distribution of seed. Distribution is very important and everybody knows that, but if you are going to build up an organisation it must be production *plus* distribution.

33,717. While on that point, may I ask you whether you are using the co-operative organisation for propaganda purposes at all?—Very little at present. But I am not quite sure as to what you mean by propaganda?

33,718. I mean propaganda in the widest sense, that is whether you were putting out information through the co-operative organisation?—Not up to the present. We are contemplating it.

33,719. Supposing you desire to distribute a leaflet for dealing with, let us say, a plant pest?—Yes, we have, but I think any propaganda of that sort would not reach one cultivator in 5,000.

33,720. I suppose you do publish a certain amount of literature of that sort in the vernacular?—We publish the Journal in the vernacular, but I would not say that it is done on such a large scale as obtains in Bombay or Madras. In my opinion, there is only one possible way of education if that education is to be of any use, and that is by showing that you can do something better than the cultivator can do it himself.

33,721. And also to show him that your method is sufficiently better than his own to make it worth his while?—Yes.

33,722. I have one or two questions to ask you about agricultural indebtedness. Has there been a survey of indebtedness in the Provinces?—No. I am afraid I know very little of this subject and can give you no useful information.

33,723. Would you attach importance to such a survey being carried out?—Yes. It would be a desirable thing, but I am not prepared to go further than that.

33,724. Do you think it would be well if there could be established in this country, on a commercial basis, seed merchants such as we have in Great Britain?—Undoubtedly.

33,725. Is there any hope of such merchants being established?—We hope that our aided private farms will develop into agencies for this.

33,726. Without at the same time developing into moneylenders?—It is very difficult to say; I could not give an answer to that question.

33,727. Seed merchants in Great Britain occasionally lend money?—Yes, it is all done on the system of advances. We hope that our system of private farms will develop into small seed agencies.

33,728. Have you anything that you wish to say about the railway services?—No.

33,729. Have you no particular suggestions to make as to the building of new branch lines in any particular district?—I wish to make no representation on that point.

33,730. And about road communications other than those which you have mentioned in connection with marketing?—No. I think the programme of the Board of Communications is very good and the full demand could not be met for many years.

33,731. *Sir Ganga Ram:* Is there a separate Board of Communications?—Yes, dealing with provincial communications of all kinds.

33,732. *The Chairman:* Including the general survey of roads under local authorities?—Yes; the Board of Communications take the grants given for communications into their purview.

33,733. And after that their power of stimulating the local authority diminishes, I suppose?—Yes.

33,734. Have you any views on the value which the Metereological Department of the Government of India might be to the Province?—I think that on the whole the Metereological Department gives us very valuable and useful advice. I think it is one of the most efficient scientific departments in India and I value its assistance very much.

33,735. Is there anything that you would like to say about the grant of loans from public funds?—I think I have dealt with that under *taccavi*, and there is nothing more I wish to say, except that the drawback of *taccavi* is the delay necessarily involved in getting it. We are taking measures to stop that.

33,736. Do you form the view that applications for *taccavi* loans are unreasonably turned down?—No, on the whole, I should say that applications for the grant of *taccavi* receive very generous and very fair consideration.

33,737. *Sir Henry Lawrence:* Is there much complaint here of corruption and leakage?—Not over large grants of *taccavi;* but occasionally over small grants.

33,738. *The Chairman:* With regard to the Veterinary Services, Question 15, are you satisfied with the degree of co-operation which exists between your own department and the Veterinary Department?—Yes; I should say that there is as much co-operation as one can expect to get between two technical departments.

33,739. Is there anything that you would like to say about veterinary education?—No. I am afraid that is a subject on which I am not qualified to speak.

33,740. Do you meet the Veterinary Department at meetings of the Provincial Board of Agriculture?—Yes; our points of contact are two: the Provincial Board of Agriculture and the Cattle Committee.

33,741. How often does the Provincial Board of Agriculture meet?—Four times a year.

33,742. Is that enough in your judgment?—It is ample.

33,743. You consider the development of cattle breeding under a special officer as one of the successful efforts of the Agricultural Department. Can you give the Commission any indication of the effects which this successful effort has had on the quality of the cattle?—What I based my knowledge on was the stimulated interest in improved cattle breeding. There is a tremendous interest taken in cattle breeding and, what is a striking evidence, is the controlled breeding areas which have been established. That, I think, is the most promising of the cattle breeding efforts.

33,744. And the movement, in your judgment, does show life?—More life, I should say, than any of our other activities at the moment.

33,745. Probably you would rather not deal with the question of fodder?—I think it would be of no use my dealing with it except in a very general way as regards the administration.

33,746. You make some interesting suggestions under your answer on pages 32-3 to Question 17 (*d*), Agricultural Industries?—Before we consider this I should like to make an alteration. The cost of machinery should be Rs.2,25,000, instead of Rs.2,00,000, and the sum stated as interest and depreciation should be increased in proportion.

33,747. Is there a proposal before the Government to take any such step as that which you suggest?—No, but I think I can very easily get such a proposal passed when I make it.

33,748. Would you be competing with any commercial undertaking?—No, we should go out of our way to remove ourselves from competition with the smaller industries, whom we should try to get to join us. I hope the Commission will be able to see at Hardoi what we are doing in this direction.

33,749. Is it your suggestion that a central institution of the sort which you suggest in your answer should be utilised for experiments of various kinds in connection with sugar?—No, the experiment is a self-contained experiment to see if a small unit will work satisfactorily. I do not propose that we should carry out experiments on different kinds of cane; all I wish is that we should work it to see if it can be adopted in this country.

33,750. Have you anything to say about spare-time occupations as against agricultural industries in the bigger sense?—No. It is a most difficult and complicated subject.

33,751. I wanted to ask you how long ago these facts have been collected? Are they the result of an enquiry of some years?—They have been collected in the last five or six months.

33,752. Do you think at this stage of development a fuller investigation of the position would be justified?—Honestly speaking, I do not think so; I do not think it will lead us very much further for the present.

33,753. In the description of the system of marketing wheat at the primary market, I see from page 33 that wheat is sold direct to the *bania*. Does no broker intervene?—Not at that stage; not in the primary market I am thinking of. They just take the carts up to the small village shop, really speaking, and dump it down there.

33,754. Then on page 34 you say: "It is difficult to distinguish at sight between cases in which the *arhatia* acts as a commission agent and as a purchaser using his own money"?—It is difficult because they would not tell you.

33,755. Is not that rather a vicious practice, combining agency work with operations as a merchant?—Yes.

33,756. Do you think there is any advantage in licensing commission agents?—It would be an advantage, but it is impossible.

33,757. Are they licensed in municipal markets at present?—I think they are at present; but the moment anything happens they go out elsewhere.

33,758. You give, on page 35, the marketing charges of 100 maunds of wheat passing through the market. Would there be any municipal tax on that wheat coming into the market?—There would be an octroi charge, of course, if it were a municipality.

33,759. Do the octroi charges vary between town and town?—I do not know; I do not think they vary largely; but that is information which can easily be got if you wish to have it.

33,760. I think it will be helpful if you could give us the octroi charges at typical markets in the various parts of the Province?—Yes.*

33,761. You suggested a moment ago that much could be done in the future by a collection of accurate and detailed facts of the position. Do you attach importance to this question at this stage of development?—Not a great deal, no. It will be very expensive; it will be a very difficult enquiry. I can only see one way of doing it, and that is by appointing somebody with training in economics to carry out the village enquiry, taking the crops of the village and tracing the product right through; and even then things would be concealed.

33,762. How about your dealings with the Forestry Department?—We have scarcely ever come into contact.

33,763. And where you do are you satisfied?—Yes. The only point where we have come into contact is for the utilisation of *usar* patches, and I have referred to it.

33,764. On the question of agricultural labour, is there a shortage of labour in the Province?—No.

33,765. Is there much migration from this Province?—I think emigration has been just reopened, but I am not sure about it.

33,766. To Assam?—Yes; but I am not quite sure.

33,767. With regard to Question 22 on Co-operation, I gather that you are in agreement with the general trend of the recommendations of the Committee† *ad hoc* which examined the co-operative organisation in the Province, and you think that meantime the attention of the department might well be devoted to putting the rural credit societies on a sound basis?—Yes; I think that is the chief thing.

33,768. I asked you some time ago on another point, as to the touch between your own and the Co-operative Department, and I think you told us that it was as sympathetic as you could wish?—Yes.

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* See Appendix II. † The Oakden Committee.

33,769. Would you attach importance to economic surveys of villages, quite apart from the question of marketing, which we were talking about a moment ago?—I should have a full economic enquiry into a whole group of villages; that is the first thing to be done. There are plenty of students now trained in the various schools of economics who could do it.

33,770. Judging from several points in your note, it is your view that the landlord classes are beginning to take a more active interest in agriculture as a whole, is it so?—I think we have now enlisted the assistance of the landholders; large scale operations on modern methods are increasing rapidly. Ten years ago there were 30 farms, and to-day there are 621 private farms. We are inducing them to produce pure seed for distribution to the cultivator. During the last 15 months the owners of private farms have undertaken to produce 20,400 maunds of seed.

33,771. *Professor Gangulee:* Are these farms owned by large landowners?—Not necessarily large landholders.

33,772. *Dr. Hyder:* When did this come about?—It has been a gradual process.

33,773. The figures for 1926 are included?—Yes.

33,774. I want to know whether the year 1926 had any particular influence on the creation of these farms, because that is not included in our terms of reference?—The rate of increase in 1926, when the tenancy legislation was introduced, was normal; it is a normal increase. ,

33,775. *Sir Ganga Ram:* Do you include gardens in that?—No.

33,776 *The Chairman:* Are you faced with water-logging problems in the Province?—To a certain extent, and I think, as I said in discussing the drainage, that it will become a serious problem in some of the canal areas; it has been taken up very vigorously by the Canal Department, and I think the steps taken are adequate; but the water level is rising in those tracts.

33,777. Before I ask any of my colleagues to question you, I should like to turn to your answer to Question 2 on page 8. The statement that you there give of the recurring expenditure in the Bulandshahr school works out at about Rs.480 per head, while in the analysis of the provincial budget which you have given the Commission it is said to be Rs.183. Probably there is some simple explanation of this discrepancy?—That is the cost of the farm, not the cost of the whole training.

33,778. Rs.183 would be part of it?—Yes.

33,779. *Raja of Parlakimedi:* You say the students trained in this Bulandshahr Agricultural School go back to their fields?—I said that they go back to the occupations which they would take up if they had not come to the school, but better equipped.

33,780. How do you keep yourselves in touch with them?—Through the demonstrators, through the local inspectors and so on.

33,781. Do they constantly apply for seed?—Not constantly; they do so at first; but gradually they become self-supporting.

33,782. Do you yourself go about much in the rural tracts?—Yes.

33,783. What is the tendency you observe at present among the cultivators? Is there any appreciable tendency for taking up improved methods?—Immediate appreciation of demonstration of superior technical skill is a thing I notice at the moment. It varies. In the eastern districts it is very much less than in the western districts. It is greatest in the western districts, where the people are well off, better educated and in better health, and it is lowest in Gorakhpur.

33,784. Does it also depend upon the demonstration farms you have in these areas?—It depends upon the quality of the work, yes. Nothing is so

quickly ridiculed in rural areas in all countries as bad farming. Everything depends upon the quality of the work.

33,785. In those areas where improved methods of cultivation enjoy greater popularity, have you got more farms and better demonstrators?—No, I should say the quality of our work is on a general level. Certain districts I am not satisfied with, but taking it as a whole there is a level in all big agricultural tracts.

33,786. As far as your experience goes, are you satisfied with what has been done by the department?—No, certainly not. I am far from satisfied.

33,787. What are the implements that are most popular among the cultivators as a rule?—Ploughs. Harrows are also coming into popularity.

33,788. Are the parts easily replaceable?—Yes, there are ploughs in existence which can be mended by the village blacksmith.

33,789. And are there depôts?—Yes. Every seed depôt is also an implement depôt.

33,790. How many depôts do you have per district?—I cannot answer that. Probably three or four.

33,791. Are definite figures prescribed for each district?—No. It is left to us to supply them where the demand is sufficient.

33,792. In agricultural vernacular middle schools are the boys taught geography?—No. They are taught only agricultural chemistry, botany, agricultural engineering, a little mathematics and English; not geography.

33,793. Are they given instruction about marketing?—Yes, they are. A rather novel feature of the school is that they cultivate plots of their own. Groups of boys cultivate nearly five acres of land and take their produce to the nearest market, e.g., Khurja, and sell it there. They learn a great deal about marketing.

33,794. Have they been told about the nearest market, and of the markets which have the greatest demand for different crops?—They know that already.

33,795. Have they a fair knowledge of the neighbouring markets?—Very wide indeed, some of them.

33,796. In the rural parts do these people who come back from your school lead a better style of life, I mean, do they adopt a higher standard of living?—I really have no statistics to go on. As far as my experience goes, such as are personal friends of mine have been very much improved by going to school. It all depends on what you take as your standard. Some of them wear better clothes.

33,797. Can they be said to be setting an example to their neighbours? Are they taking their place as rural leaders?—That I should say is very definite; as rural leaders they are very satisfactory and exercising a very good influence. That of course is the aim of the school, to enable them to take their place as rural leaders.

33,798. Do you invite them to go round to the different farms?—They go whether we invite them or not.

33,799. And thus try to improve their knowledge?—Yes. They are very keen on keeping in touch with things.

33,800. As we have in the Madras Presidency, do you have any farms where there are honorary visitors?—We have Farm Committees.

33,801. I mean, people who take an interest in agriculture?—Everybody in the Province is an honorary visitor in that sense, but the policy of the farm is controlled by the Farm Committee.

33,802. When people go there they are shown round?—Yes, but the Farm Committee exercises definite influence on the policy of the farm, the work that is done, the programme and so forth.

33,803. Is that information circulated among the people?—No, not in print.

33,804. Not even in vernacular papers?—To a certain extent, but the conditions of this Province are vastly different to those of Madras, for example, that the circulation of pamphlets would not touch one man out of five thousand or even ten thousand. It is only by example and by teaching that we can do something.

33,805. Not even in those areas where people are taking more interest in agriculture?—Where they are educated, even, I doubt if they will take the trouble to read a complicated thing requiring a lot of understanding. I do not attach much importance to the diffusion of knowledge by means of writing. I attach far more importance to example.

33,806. *Sir James MacKenna:* I think you have been the representative of the United Provinces on the Central Cotton Committee since the committee was started, but have not been able to attend any meetings. Do you not think, in those circumstances, it would be wise to recommend Government to nominate some other officer?—Yes, I had contemplated doing that, but I gather they consider I am keeping in close touch with the work of that Committee through the numerous volumes of proceedings, &c., which they publish. Scarcely a day passes but I receive a large amount of printed matter.

33,807. I do not quite appreciate your difficulties with reference to the procedure of that Committee. What is the line that they follow? Does not the scheme originate in the Province?—Yes; the scheme originates in this way. We propose (that is, I propose; Government does not make proposals) a scheme and they make a grant. They accept the scheme and then make a grant. The money is treated as an excluded fund; it cannot appear in the provincial accounts, and the Legislative Council have no opportunity of criticising my action in accepting that grant.

33,808. What would be the difficulty there?—Some people might consider that an advantage. I consider it a disadvantage, in that all our work should come in some form or other within the purview of the Legislative Council.

33,809. Do you think there is interference with Ministerial control?—I think there is no interference at present, but I think there is a situation which might very well develop into interference. I have nothing to complain of at present, but I think the chances are such that it might occur.

33,810. Is it not rather like looking a gift horse in the mouth? Do you think there is a serious difficulty?—I think there is a disadvantage. The friendly attitude of the local Council, I am convinced, is due to the fact that all our activities are without hesitation placed freely before it, and any action which tends in any way to convey an impression that we are not placing our activities before it is a disadvantage.

33,811. I want to ask you about the recruitment of Deputy Directors. Are all your Deputy Directors recruited from men who are trained overseas?—No. We have no permanent Indian Deputy Directors. Our present Indian staff are people who have been permitted to take over the duties temporarily by the Government of India. They are not Deputy Directors; they are local officers whom we have been allowed to put in as stop-gaps, but are not allowed to confirm.

33,812. Have you no Indian Deputy Directors recruited before the Lee Commission's recommendations?—Yes, one.

33,813. What are your views about the training of Indians for superior posts in the Agriculture Service? What is the best method of training?—I cannot give a general answer to that. If you take me stage by stage it will be easier.

33,814. It has been suggested in various places that probably the best method of recruitment is from men who have graduated or taken diplomas in a local college, then worked for two or three years in the department, and then given a " brushing up " either at Home or somewhere else and then promoted?—I agree with that, except that I take exception to the " brushing up." They want a general course in agriculture up to the M.Sc. stage (as I have put it, in the absence of any better phrase). It is a bad way of expressing it, but I think it conveys what I want to say. Certainly I should take strong exception to " brushing up."

33,815. I am prepared to accept your view of it. But would you develop your ideas about Pusa as a teaching centre? What do you suggest for these people?—I should suggest a general agricultural course of a higher standard than is given at present, including applied chemistry, applied entomology, dairy work, agricultural engineering, the use of machinery, agricultural economics; a general course in agriculture.

33,816. What at Home would be called an honours course, I suppose?—Yes, which would fit him to be a Deputy Director. A Deputy Director wants to know more than pure agriculture; he wants to gain a wider knowledge of applied chemistry, entomology, and a whole variety of things.

33,817. A more advanced course in the subjects he has taken in the provincial college?—Yes, from a broader point of view altogether. He wants a broader training.

33,818. Supposing you are training a man as an agricultural chemist would you give him a similar broad course with special emphasis on chemistry?—I think the cheapest way would be to send him to England. I maintain that they can learn agriculture better in India itself, under Indian conditions, however.

33,819. What about botany? Would you do the same in this case as for chemistry?—If you have a very outstanding botanist at Pusa, they might be trained there, but at present the best thing to do is to send them to England.

33,820. I understand that when you were appointed as Director of Agriculture you stipulated that you should be allowed to continue your research in sugarcane?—Yes, and that I was to have charge of a Circle. I consider it as of first class importance that the Director should be in touch with agricultural conditions.

33,821. Where are your headquarters?—At Shahjahanpur. I have just been for two months on tour to Shahjahanpur. My office, however, is here.

33,822. Do you find it makes administration more difficult?—No. On the other hand, I find it makes it much more pleasant.

33,823. The bulk of your canes are irrigated, and you are growing thick canes?—They are not thick canes.

33,824. It is irrigated, any way?—Yes.

33,825. What about Coimbatore canes?—We have had a lot of them.

33,826. How are they doing?—Pretty well, but the general opinion I have formed is that Coimbatore has not yet reached the degree of excellence that similar work has reached in Java.

33,827. You have visited Java as a member of the Sugar Committee?—Yes.

33,828. What are the relations between the Coimbatore Cane-breeding Station and these Provinces? Has there been any difficulty?—There has

been no difficulty. They send up their canes to us for trial. I have seen some publications of theirs in which they have stated what they are prepared to work out. They do not offer to be consulted; they work out their schemes of their own accord.

33,829. They send them up to you and the department tries them?—Sometimes they send the canes to me, and sometimes to the Western Circle, in charge of Dr. Parr.

33,830. You do not think they have proved their superiority as yet?—They have proved their superiority over the *deshi* canes undoubtedly, but I should say that the plant breeding work at Coimbatore has not reached the degree of excellence that it has reached in Java.

33,831. What is your view of the Central Board of Agriculture?—I should say, as low as it is possible to be.

33,832. No use at all?—None at all, and a positive impediment, I should have thought myself.

33,833. What are your reasons for that?—We get nothing of value out of it.

33,834. Your reason is that it is purely advisory? It is a bad advisory board.

33,835. Have you any experience of these sectional meetings which are concerned only with particular branches of the science? Do you not attend any of them?—

Sir Henry Lawrence: Do you attend the meetings of the Central Board of Agriculture?—Yes, when I am ordered to do so.

33,836. *Sir James MacKenna*: Do you not think that there might be some good in the sectional meetings of Botanists and Chemists?—I should not be prepared to go so far as to say that; there would be no harm in them.

33,837. *Professor Gangulee*: With regard to your remarks about Pusa being converted into a post-graduate training institution, why do you wish to confine the teaching to the M.Sc. standard?—As I have said before, I only use that as a very loose phrase. I should substitute that by anything. I merely suggested the M.Sc. standard in reply to Sir James MacKenna about higher training.

33,838. You are in favour of creating facilities at Pusa for higher training of selected students from the agricultural colleges?—Not necessarily from agricultural colleges; from anywhere.

33,839. In order to raise the status of Pusa to that of a central college of the sort that you propose here, would you suggest that you would have to have men of a higher standard as teachers and research workers?—Teachers chiefly, I should think.

33,840. And you suggest that the cost of the post-graduate training should be borne by the Central Government?—Yes.

33,841. In order to convert Pusa into a centre for post-graduate training, do you not think that a research atmosphere is fundamentally necessary?—Yes, and it is a matter of deciding how a research atmosphere can be created in an educational institution.

33,842. Can you develop an educational institution of the nature that you want to develop without proper research facilities?—You cannot. What I said was that you have got to develop a research atmosphere, and the point for discussion is how you are going to develop that research atmosphere.

33,843. You are agreed upon having Pusa as a central post-graduate college, but you say here that the research activities at Pusa are bound

to decline?—I mean by that that the research activities at Pusa for the solution of economic problems in the Provinces would decrease. For instance, the activity in relation to the production of wheat for the United Provinces and other activities of that kind are bound to disappear; the question that you are wishing to discuss is how to create a research atmosphere at Pusa.

33,844. Provided we have men of outstanding ability and scientific reputation from anywhere coming to Pusa, we can create that atmosphere?—Yes. You need not necessarily create it by investigating economic problems in Madras, the United Provinces or the Punjab.

33,845. Organised research work in this Province, I understand, was commenced from 1912?—Yes, about that time, or a little later perhaps.

33,846. It was started about 14 years ago?—Yes.

33,847. Has there been a systematic survey of important agricultural problems?—Yes. I am not quite sure that I understand you. Do you mean whether we have gone round the Province to see what we can best investigate?

33,848. What were the outstanding problems before you?—The outstanding problems before the botanical section were plant breeding and the investigation of genetics.

33,849. Was there any survey before you undertook any scheme of research?—There was a survey; that is to say, we held meetings and discussed the matter. We cannot say that we set out round the Province; what was wanted to be done was common knowledge.

33,850. Do you have a programme of research drawn up before you commence?—Yes.

33,851. Supposing a programme is drawn up for an Agricultural Chemist, what is the actual procedure?—The programme is submitted to me. If I consider it necessary, it is submitted to the Board of Agriculture.

33,852. The Provincial Board of Agriculture?—Yes; and it is approved or not approved by them, and the method is discussed by them and then carried out.

33,853. That has been the method?—Yes.

33,854. With reference to all sections, the chemical, the botanical, and so on?—Yes.

33,855. Your first attention was directed to crop improvement by selection?—No.

33,856. What was your first item of research?—Improvement of the cotton crop by cross-fertilisation.

33,857. Was it because of the lines of research then being carried out in Pusa by Mr. Howard?—No. I did not do this work personally; it was done by one of my colleagues.

33,858. Your first attention was directed to the improvement of the cotton crop by hybridisation. What was the result of that work?—The result was an accumulation of a large quantity of very valuable scientific information and the production of a number of improved varieties.

33,859. Have you obtained any variety by hybridisation?—Yes, several.

33,860. What varieties?—A variety of cotton; its number is 402.

33,861. Are you distributing seeds of that cotton?—We are not distributing; we are now engaged in the mass production of seed.

33,862. Was the result of your hybridisation work this, that you got one variety of improved cotton?—We have got more; I am taking one as an example.

33,863. Then you undertook cotton improvement by selection?—Yes, in the department.

33,864. Your selection produced a better yielding type of cotton known as Aligarh 19?—Yes.

33,865. In connection with you selection and hybridisation work, did you receive any assistance from Pusa?—As far as my personal knowledge goes, none.

33,866. How does Aligarh 19 compare with the local varieties in yield?—Do you mind if I consult my colleague?

(*Dr. A. E. Parr, Deputy Director of Agriculture, Western Circle, replied to Questions* 33,867-33,874 *inclusive.*)

33,867. How does Aligarh 19, which you have evolved by selection, compare with the local varieties, first in yield and second in staple?—It is about the same in staple, and I should say, roughly, over a period of five years, about 20 per cent. higher in yield.

33,868. Higher than the local varieties?—Yes, which it is quickly replacing.

33,869. Does this evolved Aligarh 19 obtain a premium price in the market?—It is sold at a premium merely on account of its colour, not on account of its staple or anything else. It has two advantages, its high yield, and it is sold at a premium on account of its colour.

33,870. Do you distribute the seed of Aligarh 19?—That, I understand, is done in other circles; I am in charge of the Western Circle.

33,871. Any other variety?—Not at present.

33,872. So that, the seed of type 402 which you have got from hybridisation, is not distributed?—I believe it is being distributed in some of the circles, but not in the circle that I am in charge of at present.

33,873. So, the main result hitherto obtained from your cotton work is Aligarh 19?—Yes.

33,874. Has anything been done to study the various soil conditions in the growth of this particular variety of cotton, to see whether the higher yield is due to the selection work or due to the variation in soil conditions?—Of course, we grow it under a variety of conditions. I have a large number of farms in my circle, and I test it. At the same time, I agree with your suggestion that in certain soil conditions it would not yield so well. The United Provinces, as far as cotton is concerned, may be divided into many tracts, and I do not think that you will ever get one type which will be successful everywhere. This is the type peculiarly suited to the dry and hard conditions of the west of the Province.

33,875. *Mr. Clarke:* May I suggest that detailed questions with regard to the records of yield, &c., should be reserved for examination tomorrow?

33,876. *Professor Gangulee*: (*to Mr. Clarke*) With regard to wheat, would you like me to question Dr. Parr?—General questions I am prepared to answer.

33,877. You have already stated, in reply to the Chairman, that there has not been a systematic soil survey in the Province, and you have stated that it is not necessary. Is not such a survey quite helpful in soil investigation work?—I do not consider it is so.

33,878. You do not think that a soil survey helps in any way?—I am not prepared to make a general statement like that about soil survey, but in these Provinces I do not consider that a soil survey is necessary.

33,879. Your soils are rich in potash and lime and deficient in phosphates. Is your department carrying on researches on the availability of various

phosphatic manures for growing crops?—I consider that there is enough general information on that subject to keep us going for a good length of time, and special researches are not required at the moment.

33,880. You have not carried out any researches?—No.

33,881. What is your view with regard to the export of bones?—From the purely agricultural point of view there can be no doubt that it would be much better to keep all the phosphorus there is in the country; whether it would be sound from a fiscal point of view I am not prepared to say.

33,882. From the agricultural point of view, you would like to prohibit the export of bone meal?—Yes, undoubtedly.

33,883. Do you find any indication of bone meal being extensively used as manure in this Province?—Not extensively; it is coming into use.

33,884. I understand sulphate of ammonia is being used increasingly?—Yes, it is coming in slowly and gradually.

33,885. In all your experimental stations, are you carrying on any experiments to show the influence of various manures, firstly on yield, and secondly on the quality of the crop?—Yes, we are now beginning. Since fertilisers became a practical and workable proposition we have begun that.

33,886. So that you have not sufficient data yet?—No, we have not. All these experiments, as I have said in my evidence, are extremely difficult to carry out, and they are expensive because an experiment which does not cover a considerable area is of no value. The old style of agricultural experiment on odd plots here and there is perfectly useless.

33,887. In the provincial memorandum* submitted to us, you state that the manurial problem is at present a nitrogen problem. Has it been possible for your research workers to study this nitrogen problem in all its bearings?—Do you mean with regard to the recuperative processes at work in the soil.

33,888. That is the biological factor; I am speaking first of all of the conservation of soil nitrogen?—That is recuperation.

33,889. And then there is the chemical factor of nitrogen fixation?—Do you mean the recuperative processes at work in the soil?

33,890. Yes?—It is being investigated.

33,891. You have a Soil Biologist here?—No, our Agricultural Chemist is competent to do that work.

33,892. Is he doing it?—Yes.

33,893. So that you are studying this question from the point of view of soil biology?—Yes, it can be studied from no other point of view.

33,894. There are other things: soil texture may be taken into consideration and bio-chemical factors may be involved?—It is all in relation to the bio-chemical factors.

33,895. You have no Soil Physicist working in your research station?—No.

33,896. From what point of view have you been studying the problem of alkaline land? In your note you do not make any reference to any scientific investigation?—In answer to that question, may I refer you to the answer to Question 9 (*a*) (*ii*) on page 22?

33,897. I follow that. You have been telling us about this reclamation work and my question was directed to ascertaining whether you have adequate knowledge of the formation of alkaline soils?—Not complete knowledge.

33,898. Particularly with reference to the influence of irrigation?—No, I should not say we have complete knowledge.

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* Report on Agriculture in the United Provinces (not printed).

33,899. Soil investigation in the United Provinces with a view to obtaining some knowledge as regards the formation of alkaline soil, and with particular reference to the influence of irrigation, is most important. Among the various items of research work to which you have referred to-day, you have mentioned your cotton work, your soil work, and so on; I want to know whether there has been continuity of research work; that is to say, whether, when you have taken up a problem you have seen it through?—Those that have been continued are regarded as having been satisfactorily completed; those that are discontinued are still incomplete, of course.

33,900. Do you not think that investigations of inter-provincial importance, such as this alkaline question or the identification of pests and diseases, could be organised by a central station working in co-operation with one or more provincial experimental stations?—No, I prefer the problems to be undertaken provincially.

33,901. You would not like to see a central institution carrying on work on such fundamental problems giving you the results; and you repeat the experiments on your own farm and test the results?—I do not think such a course is possible.

33,902. In the provincial memorandum* on page 32, paragraph 162, you say that the main lines of work on which the demonstration and district staff are engaged at present is seed distribution. What definite results has your department produced which you can demonstrate? You have mentioned cotton, Aligarh 19. What else?—Wheat.

33,903. Pusa No 4?—No, Pusa No. 12.

33,904. Pusa No. 4 and No. 12?—Cawnpore No. 13 wheat, certain types of barley, certain types of fibre crops, sugarcane of various types.

33,905. But in this Province about 7¼ million acres is under rice, is it not?—It is given here; the crop is worth 41 crores.

33,906. So that no attempt has hitherto been made to produce a better and heavier yielding variety of rice?—Yes, an attempt has been made.

33,907. So that you have at present to demonstrate these improved seeds, and you tell us that 71,000 maunds of seed were distributed last year?—Yes. I will give you a later figure. 105,000 maunds.

33,908. Would you kindly tell us what crops?—Yes. I cannot give you them now, but you will find that in the annual Administration Report.

33,909. We have not got that before us. As to the area under improved seed, something like 500,000 acres are under wheat?—Yes; the later figures are: 750,000 acres under wheat and 200,000 under cotton.

33,910. Could you give us an idea what percentage of the total area of these crops has been affected by these improved varieties?—You can tell; the total area of wheat is known and is in publications which have been placed before the Commission.

33,911. You have not got those figures?—I have not got those figures with me, nor can I on the spur of the moment calculate them out.

33,912. *Mr. Calvert:* Would you accept ·7 per cent. as a fair figure for the total?—I cannot say until I have worked them out; it is a very simple calculation if you have got the figures before you

33,913. *Professor Gangulee:* Under the heading of Demonstration, on page 20, paragraph 104 of the provincial memorandum,* it says: "In 1921 Government decided that demonstration farms must be run on commercial lines." Are these farms being run on commercial lines?—Yes.

33,914. What precisely do you mean by "commercial lines"?—That is to say their audited accounts must show a profit.

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* Ibid.

33,915. By whom are the costings checked?—By a qualified auditor and accountant.

33,916. Is demonstration on the cultivator's own field more expensive than on the Government farms?—No, I should say not.

33,917. You made a reference to a Provincial Board of Agriculture. What are its functions?—Its functions are laid down in the Government Resolution*; they are to advise Government on all matters that are placed before it connected with agriculture; that is its chief function; also to distribute grants to District Boards for small schemes of agricultural development.

33,918. It has funds at its disposal?—Yes.

33,919. Does it consist of officials or non-officials?—Both officials and non-officials.

33,920. On the Provincial Board of Agriculture are departments such as that of Irrigation, Co-operation and Education represented?—The Education Department is not represented; Co-operation and Irrigation are.

33,921. Have you any district agricultural organisation?—Yes.

33,922. In all the districts?—Not in all, in 23.

33,923. What are their functions and how are they related to your Board?—Their programmes of work are submitted to the Board of Agriculture for consideration, grants are made to them, and their work is supervised.

33,924. Local committees are mentioned in this note?—They are farm committees.

33,925. Who appoints those farm committees?—Government.

33,926. What is the nature of the work of these committees?—They review the work of the farm, settle the programme and consider the budget.

33,927. Are the actual cultivators of the particular local area represented on these committees?—Yes.

33,928. In view of the reference in the first two pages of your *précis* to political reforms, I should like to ask you if you think India is likely to move to some form of federal government?—I am really not prepared to say. I wish that political questions of that nature should not be asked.

33,929. I am not asking political questions. I just wanted to know whether the centralised system of agricultural research was flourishing in such countries where there was a federal form of government?—I do not know anything about that.

33,930. You have not closely studied the organisation of the United States of America?—No. I have already said that I have not made a study of the agricultural methods of the United States.

33,931. *Mr. Calvert*: There are in this Report on Agriculture† certain statements on the economics of agriculture. Are they based on definite enquiries? Paragraph 23 at page 8 of the Report on Agriculture says: "A considerable area is cultivated by village artisans and others, who may be called allotment holders; after making due allowance for these, it has been estimated that the size of the average holding in the western districts is 6½ acres." Are those based on enquiry, or is it mere guessing?—They are not based on a very thorough enquiry. One of them is based on an enquiry made by the late Director of Agriculture, Mr. Hailey. That is the one which refers to the eastern districts. If you will combine that information with the information given in the last chapter of this report, it will give you an idea as to where it is obtained from. A lot of it as regards the west of the Province

* Government of the United Provinces—Revenue Department, Resolution No. 298/1—241, dated the 7th February, 1919. (See Appendix I.)

† Report on Agriculture in the United Provinces (not printed).

was obtained by Mr. Lane, who has been very recently occupied with settlement work, and, as regards the east of the Province, on Mr. Hailey's information, which is based merely on general observations. You are referring to the areas, I take it?

33,932. One statement is: "The decrease in size of fields and farms continues as they pass from father to son." I want to know whether that is the actual fact or whether it is merely guessing?—It is merely a general observation; it is based on my own observation in many tracts.

33,933. Does that mean that the number of cultivators is increasing faster than the cultivated areas?—Undoubtedly; our census figures show that.

33,934. It is stated that an owner does not as a rule cultivate any area himself? At what stage does he usually stop with one pair of bullocks?—He may have, say, a piece of land of 50 acres or 70 acres. It is seldom more than 50, no matter how big an area he has.

33,935. Does the amount of land cultivated by one pair of bullocks normally fix the extent of this area?—Not at all.

33,936. On this question of sub-soil water, is there usually sufficient subsoil water in a well to enable the soil to stand heavy irrigation?—The subsoil water level has risen 15 feet in the last ten years.

33,937. Reference is made on page 13, paragraph 59 of the Report,* to immoderate water-lifting?—(*Dr. Parr*): Perhaps I may say that my point was this, that water lifts very slowly, and it is easily conceivable that in any definite tracts you can lift more water and make use of water of that level quite easily.

33,938. On the question of this Bulandshahr school, my calculation works out to round about Rs.1160 per pupil. Is that a fairly accurate figure?—(*Mr. Clarke*): I should think that that is not far out.

33,939. This has been described, I think, as an attempt to provide a system of education and instruction which will fit the man for his station in life. I was wondering whether education costing Rs. 1160 was suitable for the tenant and small zamindar for whom this school is intended?—I see no reason why it makes it unsuitable.

33,940. Do you think that you would be able to increase the number of these schools throughout the Province?—Yes, there is a decided demand for them. In Council the other day two more were demanded.

33,941. Was that based on the knowledge of the total cost per pupil?—Yes, also on a full and detailed discussion of the cost of the existing school and the work done by it.

33,942. The number of tenants, we are told, is about six millions. Is your Council prepared to extend the school to cover these six million tenants?—I should not think so. That is an unreasonable proposition.

33,943. Are there any Brahmins or *Thakurs* in that school?—Yes.

33,944. Are they allowed to go to that school? Are they not prevented by their caste from doing ploughing and manuring?—I am perfectly certain that there are a large number of *Thakurs*.

33,945. Can these relatively small but substantial zamindars for whom this school has been created not afford to pay the fees for that school?—Small fees are paid as far as I remember.

33,946. But they are not prepared to pay the full fees to cover the cost?—No. It is not the policy of the Government to run the school on those lines.

33,947. Your college is intended for the larger landowners? Do they pay fees?—Yes.

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* Ibid.

33,948. Does that fee cover the cost?—No. The same policy applies here. It is not the policy of Government to run their educational institutions on commercial lines.

33,949. With regard to the use of the word " demand " for such schools: that is not a demand for education for which they have got to pay?—No, it is a demand for the education provided by the Government.

33,950. With regard to this question of seed distribution, Question 11, you say your seed distribution was carried out at a profit. Is that a profit after paying for all the cost of distribution?—The balance-sheet in the last annual report includes all the cost of supervision except that of the superior and supervising staff.

33,951. Including storage charges?—Yes.

33,952. Interest on the capital charge of the seed stores?—I rather think it does, because many of them up to the present are in hired buildings. It will certainly include the rent of the hired buildings.

33,953. On page 27 you say that each seed store holds 2,000 maunds of grain. That brings up the cost of your seed store to one rupee per acre?—Yes.

33,954. You still do that at a profit?—We have not very many central seed stores at present; we have only 19 of them out of 127 seed stores.

33,955. What I want to know is to what extent Government can continue to build these seed stores at this rate of one rupee per acre?—We have a very large margin. We do not want to carry it on at a profit. We would be quite ready to get rid of Rs. 1,44,000 profit by building seed stores and ensuring the proper condition of the seed.

33,956. Is that the type of seed store you recommend for adoption by the co-operative societies?—Yes.

33,957. Do you find your cultivators are willing to pay a premium for good seed?—Yes; the present position of the seed distribution is that of a service for the benefit of which users are willing to pay us a premium in much the same way as the users of municipal water are willing to pay for a commodity which could be obtained for nothing if quality is not considered.

33,958. You do not find that consideration of its higher price deters the cultivators from buying your seed?—We cannot say that it does; we distribute all that we get and we could distribute much more.

33,959. Would you kindly explain your reference on page 20 to the Government subsidy for the construction of tube wells? It is Rs.6,000, and the average irrigated area is round about 150 acres. The Government subsidy works out at about Rs.40 per acre?—Yes, if the calculation is correct.

33,960. And the running interest charge would be Rs.2-6-0 per acre?—Yes.

33,961. Is the reason why the Government give a large subsidy just to popularise the tube wells?—No; Government have accepted the responsibility of developing all sources of underground water as a source of irrigation supply.

33,962. Do you know whether Government propose to recoup themselves by enhancing land revenue on this irrigated land?—No; I am unable to say that.

33,963. It is a little difficult to understand how Government can continue to find this capital cost of Rs.40 per acre?—I do not know how Government propose to recoup themselves; but they are satisfied at the moment with the high prosperity that is brought about by the intensive cultivation that follows the installation of tube wells.

33,964. But the land revenue in this Province is less than Rs.2-6-0 per acre, and they are increasing yearly the recurring cost?—I am unable to throw any light on that.

33,965. There is no limit to this subsidy at present?—It is limited to 50 tube wells annually. The demand is very great for them and it will no doubt increase.

33,966. Are you in a position to tell us to what extent these attempts to reclaim the ravine land at Etwa are giving a good return in fodder?—No; I am unable to say; I do not know the conditions.

33,967. On the question of consolidation, have you formed your view after comparing the cultivators in a consolidated village with those in an unconsolidated village?—No. A really authoritative opinion cannot be expressed until an economic enquiry is held.

33,968. In your budget you have put down a small sum for import duties; would you kindly tell us what the import duties are?—As far as I know it is a financial arrangement recently come into operation; it is the duty on imported stores for scientific apparatus in the college and things like that.

33,969. Have you not tried to move for the exemption of duty on such apparatus?—I understand it is a matter of financial convenience.

33,970. Is there no duty on imported seed?—We have never imported any seed.

33,971. Not imported berseem?—No; I do not think we have imported any.

33,972. *Mr. Kamat*: On page 3, Question 1, you say: "There is a dearth of experienced workers for the problems connected with plant breeding and crop-improvement. This is traceable in part to the long delay in deciding on what basis permanent recruitment to the higher posts (including research posts) should be made. The question is still unsettled and the rules delegating powers to the Local Government are being reconsidered by the Secretary of State." I understood that after the recommendations of the Lee Commission this question was settled; but you say it is still unsettled?—I understand the exact mode in which the recruitment should be made is not yet settled; the powers to be given to the Local Government are not yet settled.

33,973. What are the rules which, you say, are being reconsidered by the Secretary of State in this respect?—The rules delegating powers to the Local Government to appoint officers to the higher posts of the Agricultural Service.

33,974. May I ask you if these are the rules which are being reconsidered?—That is my information.

33,975. Are they in any way in conflict with the recommendations of the Lee Commission, or are they in consonance with them?—I form no opinion on that.

33,976. Until these rules are finally settled, you will not be able to do any recruitment?—I understand no action is being taken until these rules are finally settled.

33,977. May I know further whether this circular about recruitment which the United Provinces Government has received from the Government of India applies to all the Provinces or whether it applies only to this Province?—That I do not know; I cannot tell you.

33,978. You said that in your six circles you had six Deputy Directors. May I know how many of these are Europeans and how many Indians?—Two are Europeans and four are Indians.

33,979. In this Province amongst the list of official witnesses we do not see the name of any Indian Deputy Director; is that purely accidental?—Yes, as far as I know it is completely accidental.

33,980. Because in other Provinces we have had the benefit of hearing the Indian Deputy Directors?—I understand you have received written evidence from all the Deputy Directors. The Questionnaire was sent to all Deputy Directors.

33,981. What I would like to know is whether the department gave an opportunity to all the Indian Deputy Directors to have their say, if they wished to?—Certainly. They had copies of the Questionnaire, which, I understand, have been answered and returned directly to the Secretaries of the Commission. The Commission has power to call them if they wish to do so.

33,982. That is not precisely what I mean. They were given, no doubt, the opportunity to send their written statement; but were they given the opportunity to appear before the Commission if they wished to do so?—I do not think I can say any more than that they had as much opportunity as any other person.

33,983. Talking about this scheme of yours regarding research, you wish to have the research work provincialised. On the other hand, in a note supplied to this Commission by the Government of India, or rather by the Liaison Officer, we have been told that if the Provinces arranged for research, progress might be slow. Do you wish, really speaking, that the Provinces should be absolutely self-contained in the matter of research?—Yes; I should prefer to see the Provinces self-contained in the matter of research and in all matters relating to agricultural development.

33,984. By self-contained, you mean that they should make no reference to the Imperial Institute at Pusa?—Not necessarily; I do not say that they should make no reference.

33,985. No reference should be made by them either for advice or for assistance; is not that what you mean?—What I mean is that they should be in a position to undertake investigations of all their major problems of provincial importance.

33,986. In that case what remains for the Imperial Institute to do, say, in the case of rice or sugarcane?—With regard to rice, I think it is a problem which is of sufficient importance to justify having a team of workers of our own to solve our own problems ourselves.

33,987. You do not think that there will be overlapping in, for instance, research on rice; Bengal is engaged in it and so also is Bombay?—There will be a certain amount of duplication of course, but I do not think duplication will be entirely a disadvantage.

33,988. You would not consider that duplication as a waste of time or energy?—No; I do not think so; I do not think it would take the form of waste of time and energy.

33,989. Supposing the three Provinces, the United Provinces, Bengal and Bombay are engaged in research on rice, who is to co-ordinate the work? Even for that, do you not want any assistance from Pusa or any other agency?—My view with regard to this is that, for the problems for which I have taken rice as an example, there is ample scope for investigation for more than one team of workers.

33,990. Quite so. Judged from the importance of rice to this Province your remarks are quite justified from one point of view; but when three Provinces are also carrying out the same work should there not be some co-ordination?—The necessary co-ordination, which is limited, could be carried out by an Agricultural Commissioner or a Development Commissioner with the Government of India.

33,991. In other words you do not wish to have a Central Advisory Board for co-ordination?—No.

33,992. You want one, two or three Development Commissioners?—Yes, permanent technical officials.

33,993. You think two or three permanent officials will be able to deal with all the different crops of India?—They are quite as competent to co-ordinate the work as, for example, the Development Commissioners in England.

33,994. They will have to be assisted by Committees or Bureaux?—No; I do not think so; I do not think they would require any assistance.

33,995. You are not in favour of these Committees or Bureaux?—I am in favour of a limited amount of co-ordination which could be obtained by permanent technical officials.

33,996. A scheme for an All-India organisation has been proposed for our consideration. I wonder whether you have read that?—No, I have not.

33,997. The outline of that scheme is that there should be an All-India organisation with the Viceroy at the head as Patron, with a number of Ministers, experts and general public, zamindars and even Indian Rulers to do propaganda work and also to carry on general advisory work in the matter of agricultural development? Are you in favour of such a scheme? —I do not know enough details of it; it depends upon the propaganda and it depends upon a variety of things. I cannot express an opinion off-hand.

33,998. You have no faith in an All-India organisation?—I would not say that; what I say is, that with the knowledge I have, I am not prepared to express an opinion.

33,999. When you propose that Pusa should be a teaching institution, may I ask whether the present Imperial officers who are doing the research work there should be transferred to the Provinces for research work and new experts for teaching work should be recruited in their place?—I do not think that necessarily follows.

34,000. Who will do the teaching work at Pusa, and who will do the research work?—Surely the present staff should be able to do the teaching work.

34,001. They should be converted into teachers and professors?—I do not think it is a matter of conversion. They are as much teachers as they are research workers.

34,002. For the Provinces, at any rate, you will have to recruit research officers of reputation?—Yes. We hope to be able to do so. It is a question of supply and demand; I do not know whether we can get them.

34,003. That is what follows from your proposals?—Yes.

34,004. Talking about agricultural education, your idea is that Deputy Collectors, Tahsildars and even Police Officers should be men who have had agricultural training in the Agricultural College. Do I understand you aright?—In my opinion, it would all be to the good if a larger proportion of these had a training such as given at the Agricultural College. It would afford them a wider insight into, and give them a wider knowledge and sympathy with, the many problems and difficulties of the agricultural classes. Recruits who have received the type of university education in science and arts now given do not always possess these. If a larger number of executive officers such as Deputy Collectors and Tahsildars and even Police Officers were recruited from the Agricultural College, I think we should find agricultural progress accelerated.

34,005. Do you not think it would be putting a premium on the training given at the Agricultural College for Government service?—Not if the number were limited.

34,006. But, in another place, you have expressed your view against guaranteeing posts to agricultural school men?—That is for the agricultural school, not for the Agricultural College.

34,007. Do you think that a wholesome principle?—I think it would be a good thing for the Agricultural College (if it is developed on the lines on which we wish to develop it, but for an agricultural vocational school it is not right to have such a principle.

34,008. Why do you accept the principle in one case and not in the other?—The Agricultural College is giving training of a University character, but the agricultural school is giving training purely of a vocational character.

34,009. In answer to Question 17 (*d*), on page 33, talking about the manufacture of sugar as an industry by modern methods, you think that an experimental plant costing about Rs.1,23,000 would be a business proposition as a model for the people to follow?—It would cost Rs.2,25,000.

34,010. Have you made any effort to obtain from the Local Government a grant for this amount?—Not yet.

34,011. Do you think it would be worth while to attempt it?—Yes, I certainly think so.

34,012. Especially in view of the fact that sugarcane in the United Provinces is a large crop?—The scheme is not based on the establishment of one unit; it is based on the establishment of many units. What I say is that one experimental unit must be tried before we can recommend the establishment of a chain of units.

34,013. But even for one unit, it has not yet been tried?—No. We have the specifications and full details of it in hand.

34,014. Talking about improved seed and the additional profit therefrom, have you ever estimated what the net additional yield per acre is from the use of the improved seed?—Experiments are being conducted with regard to sugarcane only. The outturn tests show that 32 maunds of *gur* per acre is the normal yield of indigenous sugarcane in this Province. With a very little improvement in cultivation and better varieties, you can produce 60 maunds of *gur* per acre, and with improved varieties and intensive cultivation you can go up to 100 maunds of *gur* per acre.

34,015. So that the net additional profit is about Rs.42 an acre?—No; I am talking about the quantity of *gur*.

34,016. *Sir Ganga Ram*: With Government canes?—Coimbatore, Java and various other improved canes.

34,017. *Mr. Kamat*: On page 125 of the Report on Agriculture in the United Provinces there is a statement showing the yield in lbs. per acre of different crops during the last ten years. Taking the two crops, wheat and rice, if you take the figures of yield from 1914 to 1924, is that a steady upward curve?—Of course it is not; I can see that the fiugres vary considerably.

34,018. Even at first sight, it does not show that it is a steady upward curve?—Would it equally suit your purpose if I take a crop with which I am familiar, for instance, sugarcane?

34,019. I do not know whether it is the most favourable crop. Why not take rice?—It happens to be a crop with which I am not familiar.

34,020. I am prepared to take rice or wheat. In 1914, the yield of wheat per acre was 933 lbs. During the next ten years it has not distinctly gone above that, and in 1923-24 it is 817. Take again the next important crop, rice. Ten years ago the yield per acre was 734 lbs.; it has not gone up steadily. On the contrary, in some years it has gone down, and in 1923-24 it was 627 lbs., which is much less than in 1914-15. Now if you say that your improved seed has given you a decided profit, how do you account for the figures in this statement?—The real explanation is that these returns are based on a series of outturn tests in which the results of the use of improved seeds have not yet been incorporated.

34,021. Then, there is a statement in the memorandum supplied by the Government to the effect that the Director of Agriculture estimates the additional profit derived from improved seed by the zamindars and cultivators at £1,000,000. How was that figure arrived at?—It was arrived at in this way: From the seed distributed, assuming that eight acres are grown for every seven acres grown in the previous year, we arrive at 750,000 acres grown under improved wheat. By a similar process of calculation, we have arrived at 200,000 acres under improved cotton, giving a return of Rs.15 extra per acre.

34,022. But the table of comparative yields during the last ten years which I just referred to does not support this view?—It does not, for the simple reason that the outturn tests of improved varieties are not included in it. At some future date, when the rules for outturn tests are revised, these will be included and shown. Of course, these are not absolutely correct.

34,023. You agree, therefore, that these are not quite correct?—Yes, for the simple reason that the outturn tests on which these are based do not yet include improved crops.

34,024. *Professor Gangulee*: Why was it not included?—The rules have not been changed. They ought to be included, of course, but they are not included.

34,025. *Mr. Pim*. I want to clear up two or three points in your evidence. You referred to the Board of Communications as controlling all kinds of communications. Has that Board, as a matter of fact, any money at its disposal?—I understand that it has grants from the District Boards allotted to it.

34,026. I am afraid not; I am afraid it has no money at all?—Then I was wrong.

34,027. They occasionally recommend grants, but they control nothing?—Yes.

34,028. There is a sentence on page 5 of the provincial memorandum which is perhaps too generally worded?—I may say at once that I did not prepare the memorandum.

34,029. It says: "Conversely, the higher castes, Brahmins and *Thakurs* in particular, generally make poor agriculturists. Men of these castes are handicapped by caste rules which forbid their handling of the plough, much more of course the touching of manure." That is a very general statement. Is it, as a matter of fact, true that all *Thakurs* and Brahmins cannot handle the plough?—I do not think it is the case.

34,030. You would not abide by that statement?—No. I did not write the memorandum; I should not have put it in at all.

34,031. Later on, I understood you to say that no landlord carried on private farms until very recently. Is that strictly correct?—I did not say that no landlord carried on private farms. I said, ten years ago I doubt if more than 30 private farms were in existence.

34,032. When you said that, you had in mind private farms run on improved lines?—Yes.

34,033. That does not mean that landlords did not carry on farms of their own before that?—There was nothing more than *batai* cultivation that I know of.

34,034. Do you not think that they cultivated through their own servants?—I never came across any examples of landlords cultivating through their servants; it was *batai* as a rule.

34,035. But your special reference was to farming on improved lines?—Yes; the whole thing was turning on that.

34,036. You said that there were no agriculturists in the vernacular middle schools?—I am not aware that I said so.

34,037. I understood you to say that agriculturists did not get into those schools?—I said the ordinary village cultivator generally leaves school at about the third class of the primary school. There are a few of them who get to the agricultural middle schools.

34,038. You did not mean the cultivators in general?—I meant the cultivators the Chairman was referring to. The people who go to the Bulandshahr school get into the vernacular middle schools.

34,039. With regard to the movement of grain, you spoke of its having to pay octroi when it comes into municipal limits. Is octroi, as a matter of fact, levied in all municipalities?—I think it is. I promised a further enquiry into that.

34,040. With regard to the fragmentation of holdings, would you say that the problem was of the same kind in all parts of the Province? In certain areas of the Province, is not the land much more uniform than in certain other areas?—Fragmentation occurs much more in the east than elsewhere.

34,041. Do you not think that it is closely connected with the degree of variation in the types of soil?—Yes. I think that on a minute examination it would be found to be so. The wider the variation in the village soil, the greater would be the fragmentation.

34,042. *The Chairman:* Mr. Pim, what is the position with regard to octroi, in case any of my colleagues want to deal with it?

Mr. Pim: Some of the principal markets such as Cawnpore have terminal taxes and tolls which are practically a low octroi rate without refunds. Under the ordinary octroi rules which are in force in most of the other Municipalities, an octroi is levied on imports, but if the grain is again exported, the whole charge should be returned, so that there should be no net charge on grain which is imported and re-exported.

34,043. *The Chairman:* What is the position with regard to the cart tax?

Mr. Pim: The Municipalities do not levy a cart tax on carts bringing grain into the Municipal area the owners of which reside outside that area. They sometimes have a tax on carts living and plying within Municipal limits.

34,044. *Sir Henry Lawrence:* Could you explain a little more the point you made with regard to the Central Cotton Committee and its grant, and the disadvantage you saw in this money not being under the control of the Legislative Council? Is there in fact any such money not within the control of the Legislative Council now?—We have accepted a grant and a discussion is now proceeding as to whether this should be regarded as an excluded fund or whether it should go before the Council. The desire of the Cotton Committee is to treat it as an excluded fund.

34,045. Both their contribution and your contribution?—No, to treat their contribution only as an excluded fund.

34,046. Then in that case would the question arise of your contribution being outside the scope of the Legislative Council?—No, certainly not; it never has arisen.

34,047. I misunderstood your point; I thought you said that some provincial money was excluded?—No, that would never be so; that is impossible under the financial rules; all our money is voted by the Council and passes through the provincial accounts; but part of the contribution to this scheme does not pass through the provincial accounts, nor does it come within the purview of the Legislative Council; that in my opinion is a mistake.

34,048. That is money derived from a cotton cess, is it not?—From a tax, yes.

34,049. And not from the provincial fund in any way?—No.

34,050. And you are anticipating that the Local Council might have an objection?—I am anticipating that they would probably object to the whole of our financial proposals for that particular scheme not going before them.

34,051. That again would seem to infer that the provincial money was going to be spent without their cognisance?—No, there is no such inference. Let us suppose we spend Rs. 60,000 of provincial money on a scheme which is going to cost Rs. 80,000. These are hypothetical figures. We ask them for Rs. 60,000, but we do not say a word about the Rs. 20,000; they might take exception to our asking them for the Rs. 60,000 without saying we are getting the Rs. 20,000.

34,052. They might, but the matter has not arisen so far?—It has not arisen in Council yet, but it is now being considered.

34,053. You mentioned a permanent Development Board. What is your conception of the best scheme for this permanent Development Board?—A body of technical permanent officials who keep in touch with the local departments by frequent touring and know the type and class of work that is being done in the Provinces.

34,054. Under whom would they work?—They would be under the Government of India, presumably in the Department of Health, Education and Lands.

34,055. Would they have any authority over the local departments?—No, they could only report. I should imagine the relations would be very similar to those of the Development Commissioners in England: a grant is given to a college in England; the Commissioners go round and look at it, and if they do not approve of what is being done, they discuss that with the local authorities, and then, of course, withdraw the grant, if not satisfied.

34,056. So that what you envisage is that this Board should have certain funds provided by the Government of India?—No, the Board could not, because the Board would consist purely of officials. I was not thinking of a Board of Development; I was thinking of Agricultural Commissioners.

34,057. There might or might not be a Board; that is a matter of terms?—But I was not thinking of a Board.

34,058. But these Agricultural Commissioners would have certain funds at their disposal?—No, the Government of India should allot funds on their recommendation, which is an entirely different matter.

34,059. And these funds then should be placed at the disposal of the Local Government?—Yes, for schemes which have been approved by the Minister. It would not be a Board; I do not like the proposal of a Board with funds at its disposal.

34,060. Would there be sufficient work for the Commissioners?—Ample I think for one or two Commissioners.

34,061. How many Commissioners would you suggest?—One might be enough at first; it might be extended to two if there was too much work for one.

34,062. They should just go round and study what is being done?—Study what is being done, tell other people, and see if the money given by the Government of India is spent for the purpose for which it was allotted.

34,063. A co-ordinating agency?—An official co-ordinating agency. I think an almost similar organisation exists in England.

34,064. And on their advice certain grants should be given. You suggest some points on which the Government of India might give grants; I notice one of them is mentioned in your answer to Question 8, page 21; it is that the Government of India should subsidise the making of tube wells. That is a matter of very local importance, is it not, for the Government of India to expend their Imperial funds upon?—I have never taken the view that Imperial funds should not be spent on matters of local importance. It is matters of local importance that do really matter. They are all matters of local importance, even the most momentous schemes.

34,065. Your proposal in regard to that attracted my attention, and now that Mr. Calvert has pointed out that this apparently means a loss of Rs.2-4-0 per acre, I thought possibly you thought that might be a very suitable matter for the Government of India to bear?—It does not mean an economic loss, because about twice as much is produced from that man's work than before the tube well was introduced; it is only a question of who is to bear the cost.

34,066. Then in the same connection, in answer to Question 11, on page 28, you mention that advances for seed distribution are met by funds provided by the Government of India. That, I understand, is the present position, is it?—Yes, that is the present position; it has been in vogue for a long time; we have about Rs.5 lakhs I understand, of which I have got Rs.2,80,000.

34,067. Is that an annual grant?—No, it is an advance.

34,068. It is a form of *taccavi*?—No, it is an advance from the Government of India to this Government. I cannot tell you the exact technical details of the financial procedure, but it is an advance.

34,069. And this Government is responsible to the Government of India for its repayment?—Yes. We have utilised that, as our balance sheet shows, at a considerable profit.

34,070. It is not a very large advance from the Government of India. In your last paragraph in answer to Question 15 you suggest that a Subordinate Veterinary Service should be organised on similar lines to that of the Subordinate Agricultural Service, and you say: "I am strengthened in this view by the results of attempts to co-operate with the agricultural committees of the District Boards with regard to the general agricultural propaganda and education." What has been the result of those attempts?—The matter was discussed at great length in the Legislative Council last week. The position is this: we have utilised District Boards in the past; we recognise that their local knowledge and advice are of great assistance to us, but we are not convinced that they are in a position to take over the functions of a technical department such as the Agricultural Department. Anybody with any experience of District Boards will not find this surprising; they are overwhelmed with the executive work in rural areas, and they have not the time to attend to the technical details necessary for agricultural work; therefore I conclude they have not the time and attention to deal with the details necessary for the control of veterinary work. We found that there are a few things that District Boards can carry out very effectively, but no success or very little success has been attained in subjects which require constant, detailed, expert supervision such as the management of experimental and demonstration farms, demonstration on cultivators' fields, the production and distribution of seed. From that experience I conclude that they do not possess the time or the capacity to develop veterinary work.

34,071. The District Boards have not so far been placed in the same position in regard to agricultural propaganda that they hold with regard to veterinary work, have they?—Not completely, not exactly the same. The analogy is great.

34,072. What have they done in matters of agricultural propaganda so far?—In 1923 we asked all District Boards to form agricultural sub-committees, and 23 out of 48 responded. In June of that year I wrote to the Chairmen of the agricultural sub-committees, asked them to prepare programmes of work, and suggested a variety of projects which they should take up. Eleven of them sent in programmes which we considered, and grants amounting to Rs 12,000 were made to enable them to carry out their work. A consideration of the first year's work, however, brought out several facts very clearly; it was found that the District Boards were successful in carrying out certain things; one was the setting up of farms for rural cattle breeding, and the other was the establishment of farms for agricultural teaching in vernacular schools.

34,073. I see in this Report on Agriculture, on page 38, it is stated that no question has attracted more public attention in recent years than that of the improvement of our cattle. Is that in accordance with your experience?—Yes.

34,074. Do you consider that public opinion is behind you in these attempts to improve the cattle?—Yes, I think it is more behind us in the attempts to improve cattle than in any of our other activities.

34,075. Your controlled breeding areas are working satisfactorily?—Yes, that is one of our most promising lines of work. The exact details of this will be given by the Deputy Director when he gives oral evidence before you; they will be found in my administration reports for 1925-26.

34,076. Can you say how many bulls you are distributing?—It is given in my memorandum and in my answers to the Questionnaire.

34,077. There is a reference here to cross-breeding for milk purposes with Ayrshire and Holstein; has that been done under your care?—It is done in the Agricultural Department, but not under my immediate technical supervision.

34,078. Then you would rather I asked somebody else about that?—I cannot answer technical questions about cattle breeding.

34,079. But, generally speaking, is that experiment working satisfactorily?—No, I was told by the Deputy Director, who will give you details of this, that the crosses are more liable to disease than other breeds.

34,080. That is the main difficulty?—Yes.

34,081. Are you demonstrating silage on all your farms?—On the cattle breeding farms and certain other farms belonging to zamindars and talukdars.

34,082. What has your experience been? Was it generally satisfactory?—It is too early yet to express a definite opinion, because it was started only two years ago.

34,083. *Sir Ganga Ram*: On page 19, Question 8, you say that you bored 673 wells and the total was 38,057 feet. That works out to 56 feet per well on the average. Can you say what was the maximum and what was the minimum?—I am afraid I am not in a position to answer that.

34,084. I see lower down that you have put down "4-inch cutting shoe." Do you put anything below as a sort of strainer?—I am afraid I cannot answer technical details of well boring.

34,085. Who would answer that?—The Agricultural Engineer has submitted a written note of evidence, and you may call him.

34,086. Is agricultural engineering not a subject in the college?—Yes.

34,087. Do you give any degrees in the college?—There is only the diploma.

34,088. Is it your experience that these diploma holders are very much sought after by landlords?—Not very much.

34,089. Do they get any?—A few only.

34,090. What percentage?—I should think 3 or 4 per cent.

34,091. Have you any farm attached to the Agricultural College?—Yes, a large farm of 300 acres.

34,092. Are any of your students taken in the Revenue Department?—Not directly now.

34,093. You will remember, perhaps, that formerly the function of the agricultural school was to give them a sort of passport?—That was abolished in 1914.

34,094. What do the rest do?—Many of them go back into rural employments.

34,094A. Then there is no question of unemployment amongst them?—Just a little.

34,095. I suppose they often apply to you for employment?—Yes, that is so; but I do not think that they are always without employment. They are probably helping their parents in rural business.

34,096. In the Punjab we find people applying for police appointments. What I mean to say is, do your college products stick to agriculture?—I should think that they do not differ in a marked manner from the products of other Provinces.

34,097. You admit that there are problems of research which concern all India?—Yes, there are a certain number. I have given examples.

34,098. Could you make out a list showing, for five years ahead, what problems are of an All-India nature and what of a local nature?—I fear I could not.

34.099. You could not prepare it from your experience?—No.

34,100. Have you any voice in the Board of Communications?—I used to be a member, but I do not think I am now.

34,101. Can you say from your experience whether the unmetalled roads are bridged all over in this Province?—Speaking, not as a member of the Board of Communications, but merely as a casual traveller, I think that a fairly large number of them are.

34,102. There are no unbridged roads that you know of?—Yes, I know of some.

34,103. Do you find any difficulty in travelling about for want of bridges?—In the eastern part of the Province you get pulled up occasionally, but I should say that you got pulled up far less than one would imagine.

34,104. Whom do these streams belong to? Can anyone put up a dam and irrigate his land?—I do not know the law on the subject. A good many zamindars put up a bund and if they get a cusec of water they pump it up.

34,105. Without sanction or with sanction?—I could not tell you.

34,106. You do not know if any sanction is required?—They often come to ask me to arrange for a pump to be put up.

34,107. There is a Northern India Drainage Act? Are you subject to that or not?—I do not know it and I have never heard of it.

34,108. You have never studied it?—No.

34,109. Are these yields which you have given here for *barani* canal irrigated or well irrigated areas?—This chapter was prepared by the Revenue Department, not by my department.

34,110. The yield of crops must concern you?—It is described somewhere in the manuscript.

34,111. Are these yields for three classes of land or what?—I am afraid I cannot answer that question without referring to the book. You will find your information in the crop report, a copy of which can be sent to you.

34,112. I consider your yields are very, very low as compared with other Provinces, especially with the Punjab. Perhaps 10 maunds is *barani*, not irrigated land?—We do not get those yields. This must be on unirrigated land. It is 10 on unirrigated and 15 on irrigated.

34,113. Do you suggest that you want one maund of seed per acre?—I have always sown it myself. For 20 years I have sown 82 lbs. on all my farms.

In the Punjab we use only 20 to 25, in fact, not more than 25.

34,114. Do you make *shukkar* from sugarcane?—No, only *rab* and *gur*.

34,115. All these yields are, I consider, very, very low, and so I want to know whether they are *barani* lands or irrigated lands?—That information can be supplied to you, but I cannot lay my hands on it just now. It is given somewhere in the context, and I cannot remember where it is now.

34,116. Your greatest difficulty for irrigation purposes is during the months of April and May?—Until the break of the monsoons.

34,117. What method have you considered to overcome that difficulty? Have you any proposals to that effect?—We have only used the water available in the best possible manner.

34,118. I wish to ask you for your opinion on one point. Supposing tube wells are put in by Government and worked on the co-operative system, could that be done?—Yes; if you see my answer on co-operation, you will see I have recommended it. I have given some of our activities which are suitable for co-operative organisations, irrigation by means of tube wells and pumping plant.

34,119. What I mean is, whether the co-operative system can be applied to it?—I have stated here that it it is one of our activities which I recommend.

34,120. Has that been tried?—It has been tried, but it has not been successful in the two cases, not because the tube well was not good, but because the co-operative society was not successful. The society was badly organised, and it failed. Since then the tube wells have been taken over by the Agricultural Department who have made a success of it.

34,121. On page 10 of the Report on Agriculture, you say at paragraph 43 that the soils of the United Provinces are rich in potash and lime? Is that your observation or is it based on an analysis of the soil?—I might point out that you cannot observe potash.

34,122. I want to ask you whether you have analysed them?—I have analysed them myself many times.

34,123. In which part? The whole Province cannot be of the same texture? —We have analysed representative soils all over the Province, and we found all of them rich in potash and lime.

34,124. Have you found out how much chemicals each crop takes away in their *plus* and *minus* process? Have you got a list of all the crops?—I have not got a list, but it is in almost all the textbooks on agriculture.

34,125. But all textbooks differ. The American textbook says that wheat takes away 180 lbs. of nitrogen?—We have not conducted any special investigation in this Province.

34,126. Have you carried out any investigation to ascertain what depth of water is required to mature a jute crop?—Not accurately, but we know roughly.

34,127. And what is the delta water required to mature a rice crop?—I do not know; but for sugarcane in a normal year we require about 20 inches of water in some parts of the Province and 35 in others.

34,128. What is the total rainfall?—About 40 inches.

34,129. And you cannot say anything about cotton or wheat?—I have not got the figures with me.

34,130. Can you send those figures to us?—I can get figures for wheat. I think they are given here somewhere.

34,131. May I tell you that it was represented to us in Bombay that sugarcane requires 140 inches of water?—That is not my experience. My experience is that four waterings are required in Rohilkhund *plus* the rainfall; and probably a little more in western districts, but nothing like the water they pour on in Bombay.

34,132. On page 26 of the Report on Agriculture there is reference to the further development of processes for the recovery of sulphate of ammonia from coal, as a promising line for development; is that possible in this Province where you have no coal?—Of course not. We take India as a whole here.

34,133. And what would you say would be a skilful method of obtaining nitrogen from the air in a form suitable for agriculture? Have you done anything in this line?—No, we have not done anything.

34,134. Have you given any advice to the zamindars how to cultivate the land so as to get nitrogen from the air?—No, you do not mean establishment of synthetic processes. What is referred to here is establishment of manufacturing processes.

34,135. In connection with that I asked you this question. What is the best method of cultivation for accelerating the recuperative processes?—All methods of cultivation accelerate the recuperative process; frequency of harrowing, aeration, the addition of organic matter &c.

34,136. Do the zamindars fully understand that?—I do not think they understand the theory of it, but they know the process.

34,137. If they did, the yield would be better?—Perhaps.

34,138. Have you studied the recommendations of the Irrigation Commission? Perhaps I had better not ask you that question?—You should reserve that for the proper department of Government.

34,139. But still, have you not studied the report?—I have studied some paragraphs referring to well engineering and some other paragraphs that refer to my department.

34,140. Has any improvement been observed in the direction of irrigation?—There has been a very large increase in the number of *pucca* wells.

34,141. How many acres do you think can be irrigated by one well?—It depends upon the discharge of the well. The discharge varies tremendously. Some wells yield three thousand gallons an hour, others ten thousand gallons an hour. A well which has been bored may easily give ten thousand gallons an hour.

34,142. Has that been your experience?—Yes. We have often found it necessary to put pumps on them.

34,143. *Sir Thomas Middleton*: I take it from your *précis* that you have given a good deal of thought and study to the question of recruitment of staff. How long have you been in India?—Twenty years.

34,144. How long have you been engaged in teaching duties?—Twelve years.

34,145. It is occasionally suggested to us that Indian students are lacking in powers of observation. I want to get your views as a teacher on this matter?—I have no evidence of it.

34,146. Have you evidence to the contrary, provided students are properly trained?—No. I regard the Indian students as perfectly normal. I found no difference between students I taught in England and those I taught in India. The students in India are perfectly normal.

34,147. You think that some of them have got good powers of observation and, if trained, can be converted into useful men?—Most of them.

34,148. I am referring to the normal student?—The normal student or the normal agricultural student?

34,149. The average agricultural student?—There is a distinct difference. The average agricultural student in England is, or used to be, extremely stupid.

34,150. What have you to say about the average here?—The average agricultural student is slightly better in India than in England.

34,151. Then training is required in two different directions: first training for Deputy Directors, and you have indicated that one means of training Deputy Directors would be to send them to special institutions to go through a further course in general agriculture, an M.Sc. course?—I used that term loosely in the absence of a better means of saying what I want to convey to the Commission.

34,152. In your own final course here you take up (1) agriculture, (2) botany, (3) natural sciences, and facilities for specialisation are provided by you in the fourth year in four subjects. If you were sending students from Cawnpore to another institution for the purpose of training them as Deputy Directors, in which parts of this course would you require further training?—The course requires working out in detail, but I can say broadly that agriculture, applied entomology, applied chemistry, engineering, modern dairying and things of that nature. You should not confine them to what is known as agriculture. We want to broaden their minds.

34,153. But has a Deputy Director much to do with applied chemistry?—A knowledge of it is an extremely good thing. I should think, every Deputy Director recruited to the Indian Agricultural Service has received some training in it.

34,154. You already give training in it up to a point?—I should give a little more.

34,155. Now, with reference to your specific suggestion that all these Deputy Directors should be trained in one central institution, is it not a fact that for the work a Deputy Director has to do, local training and local experience are specially important?—Yes, but the advantages and disadvantages, weighed against each other, indicate very clearly that it can only be achieved in a central institution.

34,156. Looking at the question from the point of view of the student, I should think that he would be better trained in the Province where he was to work?—I disagree. I have had great experience of these matters. What we do now is to send him to England, and he would be very much better trained at Pusa than in England.

34,157. I too have experience of training, and I should prefer a Deputy Director to be trained in his Province?—So should we if we could get a college like Pusa solely for the training of Deputy Directors, but that is a counsel of perfection which can never be followed.

34,158. From the point of view of the college, no well equipped college would like to part with their best students?—They would have parted with them by then. I do not propose they should go until they had completed their course.

34,159. The M.Sc. is practically the honours course of an ordinary degree? —Yes.

34,160. I should have thought the colleges would wish to retain their best students?—I do not think they possess the facilities for giving them the advanced training that I want them to have.

34,161. These are some of the difficulties that have occurred to me. Yours is to be an M.Sc. course?—I would not stress that point. I mentioned the M.Sc. merely to convey to people who would otherwise have difficulty in understanding my remarks what it was.

34,162. You do recognise the fact that students working on an advanced subject like to earn a degree? It would be an advantage if there were an M.Sc. course?—Yes, it would be an advantage.

34,163. I fancy many of the Indian colleges are thinking of a time when they may, through affiliation to the Universities, be able to give the M.Sc. degree?—I think that will take many years. It would be a pity to wait for that.

34,164. Some of them are now moving in that direction? The next point in connection with the training of a Deputy Director is the age at which he will have finished his course?—22 to 23.

34,165. Could you then recruit the best of them as Deputy Directors?—Yes. We could work out a plan. We could take then into the Provincial Service for a year and select from them and send them on for higher training.

34,166. You agree that it would be necessary to give them some experience in the Provinces?—Yes. A variety of ways could be tried. If we had a very brilliant student, he might go straight on to Pusa.

34,167. At what age do you think a brilliant student would be qualified to undertake the work of a Deputy Director? How long would it take him to get the experience necessary, if trained in your own Province?—What happens now is that a Deputy Director is recruited from overseas, and comes out at the age of 24, and has to carry on somehow or other.

34,168. I take it you envisage a different type of training?—Yes, something like this. On passing out of the Agricultural College he would not be put in the Provincial Service, but in the Subordinate Agricultural Service. From that he would be selected as a suitable boy and sent to Pusa and finish about the age of 25.

34,169. Do you think that entrance to your Provincial Service should be in one grade, and that subsequent promotion should be by selection?—No, I would not lay down any hard-and-fast rules. Latitude is required, because we have so many special posts for which to recruit.

34,170. With regard to the training of specialists, you have indicated that it might be necessary to send them to overseas institutions to specialise in certain lines of work, but that there would be great advantage in training them in India, in plant breeding, for instance?—Yes. It depends what they are to be trained for. If you had a good staff at Pusa you could send them there.

34,171. In your own subject, chemistry, is it not possible to obtain the training you want in India?—I should prefer, as you mention a special subject, in the case of chemistry to send them Home.

34,172. On page 3, in answer to Question 1, you say that the production of better and heavier yielding varieties of crops is probably the most difficult and complicated problem facing agriculture in India to-day. I should think that it is one of the most important problems, but not the most complicated or difficult?—I think it is one of the most difficult problems.

34,173. Compared with the problem of improving cattle the difficulty is negligible?—I should put it equal to that. Have you studied the improvement of cotton?

34,174. I think I have?—That is one of the most complicated and difficult problems.

34,175. *Professor Gangulee*: Is the improvement by selection or by hybridisation?—By hybridisation.

34,176. *Sir Thomas Middleton*: You mention plant breeding and crop improvement. Is the plant-breeding work complicated?—I think, unless we start with the fundamental work, we shall not go much further.

34,177. We have asked in the Questionnaire that we might be given a list of the problems now met with by scientific investigators in the course of their work which are being held over because of lack of resources. We have got from you the plant breeding and crop improvement problems; we have got no problem of a chemical nature?—The manufacture of synthetic nitrogen compounds.

34,178. Is that a problem for Indian Chemists?—It is a chemical problem.

34,179. Is it not now a commercial problem?—It certainly is a chemical problem because it deals with a change of matter.

34,180. I had in mind one answer which you gave in which you referred to the *usar* problem as being still unsolved; it is the only chemical one mentioned, apart from synthetic nitrogen; are you in a position to provide us with other problems?—Not on the spur of the moment.

34,181. Sir Ganga Ram asked you in very general terms about all your problems; I only ask you as a Chemist for your chemical problems?—Really, I was writing this note not as a Chemist, but as a Director of Agriculture in the United Provinces.

34,182. To come to a subject which you now have in hand, that is getting a suitable officer for your plant-breeding section, your idea is to get the best man you can and pay a good salary on a five years' agreement, and I think you stated in answer to previous questions, that you will have probably to look to America. In America there is the great advantage that there they have rice crops and other Indian crops. Now I do not quite know what you are going to do with this man in a five-year period. He could teach you methods?—At any rate, he would teach our young officers the methods; that is what I want at the moment.

34,183. And you feel pretty confident that if you were authorised to offer the salary you mention you would get a good man?—I cannot say that I do feel confident. The world is suffering from a dearth of competent men; but I think I stand a very great chance of getting him.

34,184. In the particular work which you have in view he would at best be able to deal with only a small part of the problem during the period?—But he would teach the methods to the young officers in this period.

34,185. What strikes me is this: You have got your young officers here who require to be taught methods; there is, I understand, a very experienced worker on rice in Bengal; why not send them there to learn methods for breeding rice?—But we want them for all crops besides rice.

34,186. Could you use a five-year man to deal with all these crops?—I take it then that your view is that a ten-year agreement is better or no short-term agreement at all?

34,187. I think that a ten-year period would be a great improvement on a five-year one, but an expert would be likely to come either for a short five-year period or on a permanent basis. I therefore make the suggestion

that you might get training in methods within India?—We want him in the Province. Working here and there for short periods is no good. We want him to be in daily contact with us; that is the central idea of my scheme.

34,188. On page 6, Question 1, you mention a special research station for the investigation of the water requirements of crops. Has any scheme been drawn up yet or is it just a project?—It is a project.

34,189. Which would presumably be for one or two crops only, under all sorts of permutations in the conditions?—Yes.

34,190. With regard to Question 2, page 7, several references have already been made to your experimental school at Bulandshahr and I do not want to go into the question of cost; but it is obviously a case where you justify the cost in view of the results which the example of the pupils is likely to set in their own localities. You say that the average age of boys you take is 19 and that you would prefer them rather younger. I wonder whether boys going out from school at the age of 18 would be likely to be shining lights in their own localities. Do you not think that a longer course is required?—No, not for the moment. We have an alternative by which we might, later on, make it a four-year course; but I do not think it is required at the moment.

34,191. It occurred to me, in listening to the criticism, that you are spending something like Rs.1100 on what one might call five candle power light, and that a better policy might be to spend more per head in the hope of getting some lights of a hundred candle power?—I am convinced that it is meeting a need, because I have been criticised times without number in Council, last week was the latest date, for not opening more of these schools and they insisted on that. Now you see the criticism is that they are too expensive.

34,192. The Council cannot yet have any knowledge of the effects of the courses?—They have an excellent knowledge of their effects.

34,193. *Sir Henry Lawrence*: How long has this school been going?—For four years.

34,194. How many lads have been turned out?—Two batches.

34,195. Have they gone back to their fields?—Many have gone to their occupations, the occupations they would have gone to otherwise. Some of them have taken up rural industries and a variety of things.

34,196. They are mostly of the landowning class?—Yes, small landowners combined with various businesses.

34,197. *Sir Thomas Middleton*: In regard to Question 2, page 10, your institution at present combines instruction and research and I think you are aiming at a complete separation of the two?—We are willing to keep a research atmosphere in the teaching.

34,198. I think this sentence is rather severe: "This is at the best a make-shift arrangement and an administrative device for getting more work done than is paid for"?—I have worked in every capacity, as a Director and as a Research Officer, and I think I am perfectly justified in expressing that opinion.

34,199. I think you are a little hard on the administration. Do we not expect college teachers to do some investigation?—Some investigation. "Some investigation" is a different matter from economic investigations of the kind required there.

34,200. With regard to the question of providing work for the students of the college, you make the suggestion that in addition to training them to work on their own lands and for the Agricultural and Co-operative

Departments, a proportion of them should be recruited for the executive staff. Has any progress been made in that direction in the United Provinces?—Occasionally, I think, one or two get into the revenue staff.

34,201. There is no regular allotment of posts?—No.

34,202. Have you, in considering the question, decided upon the proportion of the total which, you think, could be absorbed?—It is difficult to say without proper examination; but I think it is only 5 or 6 per cent.

34,203. In discussing Question 2 on page 13 you say: "I advocate the development of Pusa as a purely teaching institute." Again the question arises in my mind, could you in teaching M.Sc. students entirely divorce research work from teaching work?—No. What I mean by a purely teaching institution is that teaching should be its principal activity.

34,204. Then you express in the following paragraph a very definite opinion, "The research activities of Pusa are bound to decline." Why do you think so?—Because the economic problems that require the presence of the officers can only be carried out in the Provinces. They could do fundamental work, but they could not undertake enormous economic researches.

34,205. You mean that if teaching were undertaken the research is bound to decline?—Yes. My idea in writing this was that it has now been realised that the problems must be tackled on the spot and not in isolated places like Pusa.

34,206. Then you are quite definite in the opinion (*See* page 17, Question 4), that "each Province should aim at becoming self-supporting in all branches of agricultural research." I do not quite understand what you mean by self-supporting?—That it should be able to attack all its major problems.

34,207. Have you framed any sort of estimate of the cost?—I could easily do so; it is not prohibitive. I should think the cost will be very little more than the cost if it is done in any other way. The problem has got to be tackled by somebody.

34,208. I am thinking of the cost of making each Province self-supporting, and of all problems arising in agricultural investigation. I may say that I have for the last ten or fifteen years been trying to assist in making England self-supporting from this point of view?—India is too large to run on the team principle like a small country like England.

34,209. That is exactly what I felt?—We would want many teams.

34,210. I can only say that expenditure at our rate would amount to something like Rs.26 lakhs a year?—That is not a large amount.

34,211. What is your total expenditure at present?—Rs.24 lakhs.

34,212. I think you misunderstand me. Rs.26 lakhs would be wanted purely for research work?—I think it would be easy to get it; it is not beyond our resources at all. I thought you were giving a figure of something like a crore of rupees. Rs.26 lakhs is a comparatively small sum. I do not know if it is under-estimated; it must be much more. Rs.26 lakhs is a flea bite in the provincial budget.

34,213. *Professor Gangulee*: What portion of the 24 lakhs is devoted to research work?—Rs.5 lakhs.

34,214. *Dr. Hyder*: Your total budget is Rs.25½ lakhs?—It is 24.4 lakhs.

34,215. And you are of opinion that you can get from the Council another 26 lakhs?—Not immediately, but in the course of a progressive programme of five or six or ten years.

34,216. That would be, in your considered opinion, a flea bite?—Yes, it would be a small sum, for agricultural development.

34,217. *The Chairman*: It would be Rs.50 lakhs in all?—Yes. I have been attacked on the ground of not asking for enough, and not on the ground of asking for too much.

34,218. *Sir Thomas Middleton*: Then, your view is that when a Province finds itself confronted with a figure which it cannot face, the Government of India should come in and help?—Yes, if it sincerely desires any agricultural development.

34,219. The figure that I mentioned was purely for current expenditure?—Recurring expenditure; I do not consider that excessive.

34,220. You would have no difficulty in getting it?—I do not mean to say that there would be no difficulty; I should think it is possible.

34,221. In your answer to Question 11, on page 24, there is a small mistake which I want to be corrected. You say: "In England the Government charge 35 shillings per cwt. for Yeoman II wheat." Government does not sell the seed there?—I can give you the place where that was taken from; it was taken from the "Times" three weeks ago.

34,222. The National Institute of Agricultural Botany does that work?—Do they sell it for that price?

34,223. I have forgotten the rate.

34,224. On the question of statistics, you are responsible for the preparation of crop forecasts. Who supplies the statistics that are published by the Government of India? Is it your department?—No. We supply the agricultural statistics only.

34,225. Do you publish statistics separately?—We have a number of publications.

34,226. In much the same form as the Government of India's summary?—It is all laid down by rule.

34,227. But the Government of India publishes abstracts only for the Provinces, yours will give details district by district?—Yes, ours is in more detail.

34,228. You mentioned that there was phosphate deficiency in all Indian soils?—That is so far as my experience goes.

34,229. The soils of the North-West?—In the Doab they are so.

34,230. You mentioned that there was an abundance of lime and potash in all your area?—As a matter of fact, I did not mention it.

34,231. In reply to Sir Ganga Ram?—It is based on an analytical basis.

34,232. Would that statement apply to the tract south of the Jumna, which is alluvium derived from Central India?—If you are referring to the black cotton soil tract, I cannot say without reference to the records.

34,233. I thought your answer referred to the Himalayan alluvium?—It referred to the sub-montane and Doab tracts.

34,234. *Dr. Hyder*: In reply to Question 1, on page 1, you say: "No power of certification exists." Is this statement based on a study of the Government of India Act?—I noticed that when I was correcting the proof. It should be "No power of certification is likely to be exercised." That is how the statement should read.

34,235. How many districts have you got in your charge?—As far as I can remember, 48.

34,236. You have got six circles?—Yes.

34,237. You have got demonstration farms, and you have got what are called demonstration plots. Do you, as the Director of Agriculture, know in how many districts you have these demonstration farms and small

demonstration plots?—We have demonstration farms and experimental farms.

34,238. But the experimental farms are located at the headquarters of each circle. In which of the districts are the demonstration farms located?—They are situated in Aligarh, Agra, Muttra, Bulandshahr, Bareilly, Naini Tal, Cawnpore, Mainpuri, Etah, Hardoi, Sultanpur, Fyzabad, Benares, and Lucknow.

34,239. Are there any districts which are without these demonstration farms?—Of course. The rest of the districts are without them.

34,240. Do you think there is room for expansion in this direction?—I think there is room for some more experimental and demonstration farms.

34,241. Would you lay emphasis on the small demonstration plots or on the demonstration farms?—I prefer the demonstration farms.

34,242. Are the demonstrations which you carry out on the ryots' holdings included in this?—No, they are not included in it.

34,243. That is over and above these?—Yes.

34,244. Is the Bundelkhand Division well supplied in this matter?—We are making a demand for a grant for an experimental farm in Jhansi this year, so I understand.

34,245. It is a very insecure tract from the point of view of rainfall?—Yes.

34,246. And the greatest need is in Bundelkhand?—There is very great need, but it is not the greatest need.

34,247. How does it compare with other tracts which have demonstration farms?—It is a precarious tract; I should not say that it constitutes the greatest need.

34,248. I understand you are not very much interested in propaganda by means of the printed word?—Not so much.

34,249. But all the same you issue a journal. What is its circulation? 1,000?—Yes, that is the approximate figure. I have had the figure worked out, but I cannot carry it in my head; it is something like that.

34,250. Would you agree with a statement which I am quoting from the Pioneer that a very high official of the Government told the writer that we have not yet reached even 1 per cent. of the rural population, and that we are merely scratching the surface? Do you think that represents accurately the facts?—The percentage of the population reached by means of the journal?

34,251. By all means, the printed word, the demonstrations which you carry out, and everything else?—I have not formed an estimate, but I think it is not more than 5 per cent.

34,252. You are interested in sugarcane?—Yes.

34,253. And Shahjanpur 48 is your particular variety?—Yes, it is known to the cultivators as Java.

34,254. You have got some areas in the United Provinces under Coimbatore 213?—Yes.

34,255. There is a statement in the Report on Agriculture in the United Provinces that the essentials as regards cane are high yields and quick maturity. Does your particular variety, Shahjanpur 48, satisfy these two conditions?—Yes.

34,256. What about Coimbatore 213?—It does not satisfy the condition of early maturing.

34,257. Are there large areas under Coimbatore 213?—I have not got correct statistics.

34,258. I understand there are only two districts in the United Provinces which can grow jute?—Yes, Kheri and Sitapur.

34,259. You cannot extend the area?—It may be possible to extend it into Bahraich.

34,260. At present you have only about 2,000 acres?—I think it is more; it is perhaps 5,000 this year.

34,261. It has increased?—Yes.

34,262. Do you think more areas might be brought under jute?—Yes, I think they might be.

34,263. You are not prepared to answer any questions on fodder, are you?—No, I am not.

34,264. That does not concern you?—No.

34,265. Do you know whether any experiments have been made with regard to the introduction of new grasses, either local or foreign?—A certain number of experiments will be found described in the annual administration reports; I will read them out to you if you like.

34,266. No, I was asking you your opinion as regards extension?—I prefer to give a complete answer, please. Experiments have been carried out with sann flower, sweet *juar*, a special kind of bamboo and *sakalin*, which have given very promising results.

34,267. You have been carrying out an experiment on wheat under your department at Hardoi, have you not?—Yes.

34,268. From that experiment you found that Pusa 12 gives the best results when it is given nitrate of soda?—I have not seen the details of the experiment and I cannot speak from personal knowledge; it is not under my personal control; it is under the Deputy Director of the Central Circle. Full information on that point can be given to the Commission when it visits Hardoi.

34,269. Do you, as a Chemist, know whether the soils of the United Provinces are deficient in this particular chemical, nitrade of soda?—I know they are deficient in nitrogen.

34,270. You have found that out?—Yes, I found that out, and many other people have found it out too; it is common knowledge.

34,271. Have you formed any idea as regards the amount of money that you would require during the next ten years for the purpose of development?—No, I have not.

34,272. So you have got no programme?—We have a programme but we have not worked it out in sufficient detail to state the exact cost.

34,273. *Raja Sir Rampal Singh*: Do you keep any record of the diploma holders leaving your college?—Yes, we keep a record, and the subsequent careers of most of the students are known.

34,274. What percentage, do you think, have joined services other than the Agricultural?—In order to give an answer to that question I should have to get the exact statistics.

34,275. What is the status of your diploma holders compared with that of the B.Sc.?—They are of equal status.

34,276. Are they treated as equal?—They are treated as holding the equivalent of a degree in science for all posts in Government service.

34,277. How many districts comprise one agricultural circle under a Deputy Director?— They vary somewhat, but I should think about six. The Province of Oudh is under one Deputy Director.

34,278. Do you not think the circle is too large?—Yes, undoubtedly.

34,279. What staff do you station in districts?—There is the Deputy Director; under him is a Divisional Superintendent, a member of the United Provinces Service, who may have three districts or possibly four under his control, sometimes two. Under them are members of the Subordinate Agricultural Service of various grades who are doing different work in different Provinces, mainly the management of seed distribution and demonstration: that is their main work, and the management of farms.

34,280. Do you think the staff is sufficient?—No. We are, as you know, aiming at a steady increase in the staff. I am not in a position to tell you what the budget proposals are, but our programme is for a steady increase in staff.

34,281. You have stated that gradually cultivators are adopting improved methods in certain localities?—Yes.

34,282. What improved implements have been adopted?—During the last year the main bulk of the implements have been ploughs; nearly 3,000 ploughs were distributed, Watts ploughs and Meston ploughs. Out of 9,000 one-third of the implements were ploughs.

34,283. Are there any special arrangements for the repair of these implements and the replacement of parts?—The simpler kind of ploughs can be quite easily repaired by the local *mistri*; every Government farm and every seed store stocks spares.

34,284. Is it not a fact that the village blacksmiths and carpenters cannot repair these implements?—They cannot repair the more complicated kinds of plough, but the simple Meston plough they can repair themselves and almost make.

34,285. I doubt it very much; my personal experience is that they have to give up the use of these implements simply because they cannot be repaired by the village blacksmiths. Is it a fact that the cultivators have to go a long distance to get these implements?—Unfortunately that is true; distances are great in this country.

34,286. Would it be useful to have some small training school or workshop where blacksmiths and carpenters could be trained?—That is a very good suggestion.

34,287. You have stated that landlords have started to do a great deal of farming within the last two years. Is that owing to improved methods of cultivation or high prices?—I attribute it to the profits obtained by better methods of farming. I think it is entirely due to better methods of cultivation. It may be assigned to a variety of causes; it might be assigned to the desire of the landlords to get hold of as much *sir* land under the new Act as they can, but I do not think it is due to that; I think it is due to a desire to benefit their tenants and to get hold of the profits occasioned by better cultivation.

34,288. There is a great demand for the distribution of seed; do you think that is because of the improvement of seed, or is it on account of *khashtkars* being poor and the rate that you charge being easier than that charged ordinarily?—I am satisfied that it is partly because of the good terms we give the *khashtkars;* that is undoubtedly one factor; we give them very fair terms. The charge is made in the most scrupulously careful manner; I think that is a contributory cause; but I should say the main cause is the increased yield obtained from the better seed.

34,289. Have they begun to appreciate that?—Yes, I think so, undoubtedly.

34,290. *Sir Ganga Ram*: You say in this Report* that you submitted some time ago a scheme for fixation of nitrogen by electricity?—I did not submit the scheme; a scheme was submitted by some technical officer to the Government of India.

* Report on Agriculture in the United Provinces (not printed).

34,291. What became of that scheme?—I cannot tell you; it is probably there now.

34,292. Have you got a copy of it?—Yes, but it is confidential; I am afraid I cannot give it to you; I cannot circulate it without the sanction of Government.

34,293. *Sir Thomas Middleton*: The present expenditure on agriculture is about 25 lakhs?—Yes, 24.4 lakhs.

34,294. What proportion of that expenditure is at present given to research?—About 5 lakhs. I can give you the exact figure if you like.

34,295. The rest goes on organisation and demonstration?—Yes.

34,296. In developing your department, would you agree that your demonstration and external work is more in need of assistance than research work, or would you first endeavour to develop research?—At the moment, as I have already stated, the first thing I should do would be to try and develop a very strong section on crop improvement.

34,297. You referred to the fact that you had a programme, but you said you had not gone into the financial details of it?—Yes. You will find a full discussion on the matter in the proceedings of the Legislative Council.

34,298. Did that programme contemplate a large development in your field work?—Yes; but as I have said, I regard the development of a section on crop improvement as being the most important thing at the moment.

34,299. In view of the fact that the total expenditure on agriculture is 25 lakhs, while the total expenditure on education in the Province is 170 lakhs, you think there will be no difficulty in getting about 26 lakhs for research?—I cannot say there will be no difficulty, but I should think it is within the bounds of possibility. I should think it is very possible.

34,300. That means that the total expenditure of your department would rise to about a crore?—About 50 lakhs.

34,301. You would not spend half your resources on research?—It would come to 52 lakhs.

34,302. That assumes no extension of your present outside activities?—Put the extension at about 5 lakhs a year; that is about all we should do.

34,303. I think a scheme constructed on those lines would be criticised?—I do not know how accurate your figures are with regard to the 26 lakhs. I cannot discuss it in detail. You tell me it is 26 lakhs; I should have thought that was rather on the small side.

34,304. *Mr. Calvert*: You say you could spend 26 lakhs on research?—No. You say my scheme would cost for every Province in India 26 lakhs. I say, if that is so, I consider it possible that this sum could be obtained. That is the position. I do not know whether your figures are correct.

34,305. My estimate was not based on the requirements of India in all agricultural matters. My figure is the annual grant to the research institute?—I have seen it; 26 lakhs seems to be a very small sum.

34,306. I doubt whether you quite realise the work which that covers. It does not cover any educational work at all, no demonstration. The total expenditure is about three times that?—Twenty-six lakhs is not the sort of figure that is going to put India on its back. I should not say the figures which you have quoted would rule any scheme out of action as a financial impossibility; far from it.

34,307. There is something wrong in that calculation. Now is this high seed rate for wheat due to poor tillering?—It has never struck me that it is exceptionally high. What is the rate in England? It is about that?

34,308. I am talking of your adjoining Province of the Punjab?—It has never struck me as unusual.

34,309. Have you any suggestions to make to lighten your duties as a Director?—Many.

34,310. Would you like to put them forward?—I do not think it would be the least good to do so.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Tuesday, the* 1*st February,* 1927.

APPENDIX I.

(QUESTION 33,917.)

GOVERNMENT OF THE UNITED PROVINCES, REVENUE DEPARTMENT.

Resolution No. 298/1—241 *of* 1919, *dated 7th February,* 1919.

Read:—

G.G.O. (Revenue and Agriculture) No. 903-88, dated the 18th September, 1918.

Read also:—

Letter No. 42/V-841-A, dated the 9th October, 1918, from the Director of Land Records and Agriculture, United Provinces.

Observations.—In a recent resolution on the annual report of the Department of Agriculture His Honour, the Lieut.-Governor, expressed the opinion that the time had arrived for the constitution of a Provincial Board of Agriculture which would meet regularly and advise on policy and administration. His Honour has decided that a Board of Agriculture should be established with effect from the 1st of April, 1919. The constitution will be as below:—

The Board shall consist of fourteen members, viz.:—

(1) The Director of Agriculture—Chairman ex-officio.

(2) One member to be elected by the Upper India Chamber of Commerce.

(3) One member to be elected by the United Provinces Chamber of Commerce.

(4) One member to be elected by the British Indian Association, Oudh.

(5) One member to be elected by the United Provinces Zamindars' Association.

(6) and (7) Two members to be appointed from amongst non-officials by the Local Government.

(8) Chief Engineer, Irrigation branch.

(9) Registrar, Co-operative Societies.

(10) Chief Conservator of Forests.

(11) Principal of the Agricultural College.

(12) and (13) Two officers of the Agricultural department nominated by the Local Government.

(14) Deputy Director of Land Records.

2. The Board will have power to appoint committees for particular objects and to co-opt for the purposes of these committees not more than two officials and two non-officials from among other than members of the Board.

3. The nominated and elected members will hold office for three years and will be eligible for re-nomination or re-election, as the case may be.

4. The duties of the Board will be mainly advisory. Its functions will be to act as adviser of the Government and the Director of Agriculture with regard to such matters as may be referred to it by the Government or by the Director for an expression of its opinion, but it may also advise in relation to any other matter which, with the permission of the chairman, may be brought before it by any member. The Governing Body of the Cawnpore Agricultural College will continue to be the adviser of the Local Government with regard to the affairs of that college. The Local Government will, every year, place at the disposal of the Board, a sum which the Board will be able to utilise for any suitable purposes, including non-recruiting grants to private persons or farms with the object of the general agricultural improvement of the province.

5. The Board will meet on such dates and at such places as the chairman may decide. A meeting should be ordinarily held once a quarter. Papers may, if the chairman considers fit, be circulated among the members of the Board.

6. Members of the Board shall draw travelling and halting allowances as laid for officers of the first class.

7. In the event of a difference of opinion among the members present at a meeting the opinion of the majority shall be held to be the opinion of the Board, and if the voting on any question be equal the chairman shall have a casting vote.

8. Any member can record a minute of dissent and the same shall, if the member so requires, be recorded in the minutes of the proceedings.

9. The Personal Assistant to the Director of Agriculture shall be ex-officio the secretary of the Board. The duties of the secretary shall be: —

(1) To prepare the agenda of the Board's meeting and to circulate the same among the members at least ten days prior to each meeting.
(2) To lay before the Board all matters for discussion.
(3) To conduct the correspondence of the Board and
(4) To prepare, keep, and circulate among members the minutes of the proceedings of the Board.

10. Sir Harcourt Butler attaches great importance to the association of non-officials and officials in this most important matter and will always be glad to receive proposals which will make the Board more efficient. He thinks that the above outlined constitution will be a good beginning for practical work.

APPENDIX II.

Statement showing rates per maund of octroi or terminal tax on the principal varieties of grain, raw sugar and cotton in typical markets in U.P.

Name of municipality.	Wheat.			Gram.			Barley.			Rice.						Pulses.			Juar, Bajra, etc			Oilseeds.			Raw sugar.			Cotton.		
										Unhusked.			Husked.																	
	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P.	R.	A.	P	R.	A.	P.	R.	A.	P.
Cawnpore (Terminal) ...	0	0	6	0	0	6	0	0	6	0	0	3	0	0	6	0	0	6	0	0	6	0	0	9	0	1	6	0	0	9
Lucknow (Octroi)	0	1	0	0	0	6	0	0	6	0	1	0	0	1	6	0	0	6	0	0	6	0	1	3	0	4	6	1	9	0% ad valorem
Gorakhpur (Octroi)	0	1	6	0	1	0	0	1	0	0	1	0	0	1	6	0	1	0	0	1	0		—		0	4	0		—	
Saharanpur (Terminal) ...	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6
Meerut (Octroi)	0	1	0	0	0	9	0	0	9	0	1	0	0	1	6	0	1	0	0	0	6	0	1	0	0	2	0		—	
Aligarh (Octroi)	0	0	6	0	0	6	0	0	6	0	0	9	0	1	0	0	0	6	0	0	6	0	0	3	0	1	6	0	0	2
Hathras (Terminal)	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0	6	0	0	3
Muzaffarnagar (Terminal) ...	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6		—		0	9	9		—	
Ghaziabad	There is no octroi or terminal tax in force.																													
Bareilly (Octroi)	0	2	0	0	0	9	0	0	9	0	1	0	0	2	0	0	1	0	0	0	9	0	0	9		—			—	
Sitapur	There is no octroi or terminal tax in force.																													
Allahabad (Octroi)	0	1	3	0	0	6	0	0	6	0	1	0	0	1	9	0	0	6	0	0	3		—		0	0	6		—	

Rates shown are per maund.

Note.—Octroi duty on goods imported into a municipality is returned if the same is exported out of it, but a terminal tax is not so returned.

Tuesday, February 1st, 1927.

LUCKNOW.

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Dr. A. E. PARR, Ph.D., Deputy Director of Agriculture, Western Circle, United Provinces.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—The budget of the Agricultural Department of the United Provinces for the year 1926-27 is 24·5 lakhs of rupees. The cultivated area is 35 million acres. The Province thus spends approximately 1 anna per cultivated acre on its Agricultural Department. Thirty-five million people, or roughly 75 per cent. of the total population, are directly dependent upon agriculture for their living. The total budget of the Province for the year 1926-27 was Rs.15,06,95,034.

No more need be said to show the extraordinary small amount of provincial revenue which is spent on the actual improvement of the staple industry of the Province. More men and money are needed in order to expand the Agricultural Department to enable it to cope to an appreciable extent with the task before it. At present it occupies a position of secondary importance in the eyes of Government as the pay of its Director clearly shows when compared with that of other Heads of Departments. The present research staff is very limited and it can tackle only a few of the very large number of problems awaiting solution. For example, selection and plant breeding work has given excellent results on some crops, but up to date it has been possible to study merely a few of the staple crops of the Province. In almost every branch of agricultural activity the problems awaiting solution are large in number. As the public awakens to the possibilities of agricultural improvements there will, no doubt, be a demand in the Legislative Council for the expenditure of much more money on the Agricultural Department.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—Demonstration and propaganda work is carried on by staff distributed in various districts of the Province. The following are the main lines of work at present:—

(1) seed distribution, (2) introduction of improved implements and demonstration of improved methods of cultivation, (3) the organisation of private farms, (4) tube-well installation and improvement of existing wells, (5) demonstration farms run on commercial lines.

The supply of pure seed which has been well stored is a leading feature of departmental activities and there is a regular public demand for further development of this work. Seed distribution is carried on by a series of farms and seed stores scattered throughout the Province. A large organisation has been built up and Government have made arrangements for financing extensive operations. Considerable areas of the departmental farms are devoted to growing selected varieties. This pure seed is used to stock and restock a large number of private farms which are supervised to some extent by the Department. In this way a large quantity of pure seed is available for distribution annually. There are now 127 dépôts in existence and 105,052 maunds of seed were sent out last year. As a result of this work, many lakhs of acres of improved varieties of crops are now being grown in the Province. These seed dépôts are also used as centres for supply of improved implements and manures.

Actual demonstration has brought several lakhs of acres under the influence of the Department within the last few years. The method of demonstration varies widely in character in different parts of the Province. In Gorakhpur, for example, the development of large estates with big areas of home land is the best way of influencing the cultivator. In another tract a promising method on the *batai* or share-of-produce system is being carried on; cultivators lend a portion of their land, cultivation methods recommended by the Department are followed, expenses are shared and profits divided after disposal of the produce. In the Rohilkhand Division, improved methods of growing sugarcane are demonstrated by hiring small areas of land for a short period, cultivation is carried out by officials of the Department who live on the spot. The cultivation of small areas of land under strict departmental control is an effective method of introducing and establishing improvements in new areas. The landowners and tenants can observe the value of new methods for themselves; they can examine the details of the cultivation at every stage and can suggest modifications which will enable them to cultivate similarly with the means at their disposal. The areas commanded by tube-well irrigation afford an excellent opportunity for this type of demonstration; tube-wells and pumping plants cannot be used to full advantage unless some form of intensive cultivation is adopted. The established practice of the Department is to start the demonstration of some form of intensive cultivation when a tube-well has been completed. Under a scheme recently sanctioned, owners are granted part of the cost of new installations in places where the Department requires facilities for demonstration or seed production, if they undertake to lease small areas of land to Government for a term of years and to supply water at fixed times and rates. The scheme provides the Department with land to cultivate for a period sufficient to establish new methods and varieties of crops without the heavy initial expenditure of a demonstration farm. In general, it may be stated that in the United Provinces demonstration must be carried out in the early stages, on the cultivator's own fields. To win his confidence an actual practical demonstration of the crop, implement, or improved method is necessary under his own conditions. He is disinclined to accept the spoken or the written word as worthy of trust when it concerns agricultural improvements. Successful practical demonstration on the spot is needed first of all to win his confidence; later on, simple improvements can be introduced by the spoken word of a practical man who has already shown his capacity to the villagers concerned. I, therefore, consider that demonstration and propaganda work can be looked upon as having two phases. First of all the suspicious peasant requires ocular demonstration of the particular improvement, no matter how simple, on his own fields. Later on, after he has become confident in his own local agricultural officers we may expect that he will come to the Department for advice instead of the Department having to go to him. Gradually, it will be possible to deal with

organised bodies in the form of agricultural associations and in this way in the course of time most of the demonstration work of the simpler improvements will be done by the people themselves. More complicated improvements will, of course, necessitate localised or centralised instruction. In the United Provinces in many districts the time has now arrived for the organisation of these local agricultural societies. Farms which have been running for several years and particularly those which during the last few years have been making satisfactory profits have become known to large areas of the districts in which they are situated, and they are the centres of pilgrimage for large numbers of agriculturists from considerable distances. I look forward to the time when every farmer, either individually or through his local agricultural organisation, will think it well worth while to keep in touch with his district farm.

QUESTION 4.—ADMINISTRATION.—I think the Government of India can best assist the Provinces in the development of their agriculture by providing men and money for research on important local problems which have not yet been tackled. The procedure followed by the Indian Central Cotton Committee seems to me an excellent one and could, I think, be copied by the Government of India with advantage; schemes for research work are sent up to the Cotton Committee and, if they are approved, the committee, so far as funds permit, give financial help; the work is then carried out under the supervision of the provincial department. The great advantage of this arrangement is that it gives facilities for investigating a definite problem where that problem is of real practical importance. A scientific sub-committee examines the schemes sent up from the Provinces and thus ensures co-ordination and prevents overlapping. A piece of work designed first of all to attack a problem peculiar to one Province may develop in such a way that it becomes of interest and importance to several Provinces or even perhaps to the whole of India.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The loss in agricultural efficiency in the United Provinces due to sub-divided and scattered holdings is very great; but, as many writers have pointed out, fragmentation is not an unmixed evil. Its chief merit is that by giving the cultivator a variety of soils and conditions it enables him to grow different types of crops and thus to gain somewhat in security against the vagaries of climate.

The chief obstacles in the way of consolidation are—

(1) the difficulty of reconciling the many interests involved;

(2) a lack of knowledge and, therefore, a lack of the appreciation of the advantages which consolidation would confer.

A special effort is required to consolidate the holdings in a few typical villages in each district to serve as examples. Consolidation has gone on in the Punjab to a considerable extent. In the first instance persuasion by experienced officers was the prime-mover, I understand; but later the people themselves took up the work with spirit. In the United Provinces our difficulties are perhaps greater; our progress has certainly been slower, and it appears that special inducements will have to be offered to produce quick results in a few cases required for demonstration. I think it would be worth while for the Government to promise remission of revenue to be followed by remission of rent as an inducement to a few typical villages to consolidate. Since division of irrigation rights is likely to be a stumbling-block in many cases, special concessions for building wells in dry fields might be offered, such as *taccavi* free of interest and free service of the Agricultural Department's well-borers.

QUESTION 8.—IRRIGATION.—The United Provinces are fortunate in having extensive irrigation systems. About 11 million acres or over 30 per cent. of the total cultivated area can be irrigated, whilst in some districts as much

as 80 per cent. of the total *rabi* area is watered. Of the total area irrigated about 3 million acres are watered from canals, 6 million from wells and the remainder from a variety of other sources. Canals now under construction will add 1½ to 2 millions acres to the above figures. When these canals are completed the supplies from the provincial rivers will be almost exhausted and little further extension from these sources will be possible. Similarly, the area irrigated from tanks and ponds is not likely to increase in the future since many of these depressions are being drained. The only remaining source of supply is the sub-soil water. Experts have estimated that not less than 12 inches of the total annual rainfall of the Province sink down to swell the water underground. Of the remainder a large part is lost in evaporation and the balance goes as a surface run-off to the rivers. Sub-soil water flows approximately at a rate of one mile a year, whereas river water disappears at not less than a mile an hour. Thus the water that reaches the rivers by underground drainage remains within our boundaries and is available for irrigation in one district or another for a long period, whereas that going direct to the rivers is beyond our reach in a very few hours. Taking the figures given above, we see that the sub-soil water is replenished each year to the extent of 12 inches. There are thus theoretically 12 inches of water under each acre of the Province available each year for irrigation without lowering the water level. Nine inches of irrigation are sufficient after a normal monsoon to grow a crop of wheat. Since little more than 50 per cent. of the total area of the Province is cultivated, even allowing a very large margin for loss, the water added to the sub-soil each year should be sufficient to mature a crop of wheat on every cultivated acre. The area irrigated from wells, as from other sources, varies considerably from year to year. In years of short rainfall there is a great increase; this indicates that in normal years much more water could be taken from the sub-soil than is usually done, without seriously lowering the water level. With large areas asking for irrigation, it is reasonable to inquire why well construction has not developed to a still greater extent. The answer is not a simple one: difficulties and cost of construction, land tenure, return from money invested, and power available for lifting water, are all limiting factors. Lack of water is not the cause. It may safely be stated that there is room for considerable extension of well irrigation in all tracts where well construction is reasonably possible. Improvements which the Agricultural Department is able to introduce make well construction in some tracts an entirely different question to-day from what it was a few years ago, and the whole problem requires reviewing from this aspect of more intensive production. Immoderate water-lifting from one area will no doubt reduce the level of sub-soil water and in some cases, particularly in dry years, put wells already constructed out of action, but this is one of the problems to be faced. Wells of this nature must be gradually replaced by others drawing on deeper layers for their water.

Some of the districts of the *doab* in which canal irrigation is common have also excellent supplies of underground water at moderate depths. Muzaffarnagar and Meerut are examples. If special inducements were offered for building wells in these districts, more canal water might be set free for use in the dry parts of Agra and Muttra, where deep wells and brackish often make even irrigated cultivation difficult. Decrease of revenue, owing to loss of water by the way, could be made up by an increased general or local charge. An additional indirect advantage to the tract concerned would be the rise in the water level which usually accompanies canal irrigation; wells which were formerly too deep to be of much use would thus become of greater practical value.

The fuller exploitation of the underground water supplies is, in my opinion, the most urgent need of the agriculture of the Province. Several

millions of dry acres are thirsting for the irrigation water present in abundance in the sub-soil at, in many cases, moderate depths. The necessary experience in well-making has now been gained and the time has arrived for a much bolder forward policy. Certain lines of advance are clear; the zamindar with a large farm will have his own power installation; for the cultivator with only two or three acres a central supply giving water to several holdings grouped as economically as possible seems the best arrangement; and for the man who occupies a midway position a *pucca* well worked by bullocks is perhaps the best scheme at present. If all combined for a big effort the area commanded by well irrigation could in my opinion be increased by one million acres in the next ten years and probably by double that amount in the following decade.

QUESTION 10.—FERTILISERS.—(*a*) During the last few years, much of my time has been occupied in running demonstration farms on commercial lines and in making them financially successful. The first essential for success has usually been found to be an adequate and secure supply of water. Where this has been obtained sufficient manure has always been the next requirement. Much experimental work has been carried out in order to discover the most economical source of fertilising material; mineral manures and organic manures have been fully tested. The general conclusion I have arrived at is that for the immediate future organic material supplied as green manure must form the basis of manuring in the west of the Province. Of the green manures tried *sanai* has so far proved the most successful. A large number of demonstrations have been carried out in the villages, and the results so far obtained clearly show that large areas of the United Provinces can profitably be manured by ploughing in green crops. Where the holdings are very small, the practice is not likely to find favour because the cultivator requires each year the whole of his area to support his family and cannot in his present financial position afford to forego an immediate small advantage for a larger one in the future. At the same time, the area under larger holdings is considerable and there is no doubt that the larger type of cultivator can profitably devote some of his fields to growing crops for green manure. Men farming on intensive lines are beginning to follow this practice. Before intensive agriculture can be taken up, a secure supply of water is essential; some of this water will be used up in growing green crops for manure. Where water is at all deficient, cultivators are reluctant to use it in growing crops for which they get no immediate financial return. Green manuring is, in fact, a way of establishing the balance between water and nitrogen where the supply of the former has outrun that of the latter. Where water is available in only small quantities in proportion to the amount of land under cultivation, the natural recuperative power of the soil supplies sufficient nitrogen to make the soil capable of making full use of the water available, but where, either from canals or wells, a liberal water supply has been arranged for, more manure is essential if full use is to be made of the irrigation facilities.

(*b*) Artificial fertilisers are at present of little importance in the agriculture of the United Provinces; until quite recently they were almost unknown to the ordinary farmer. It seems, therefore, premature to think of measures for preventing fraudulent adulteration.

(*c*) In order to popularise new and improved fertilisers, those methods of demonstration will be required which have been successful in introducing other agricultural improvements.

(*d*) Intensive manuring is at present followed in the neighbourhood of large towns where city refuse is available in large quantities for market gardening purposes. In recent years there has been a big demand for oil cakes and other manures from certain tracts where potato growing has developed on a large scale. Recent improvements in sugar cane

varieties and their cultivation are now having the effect of stimulating a demand for more manure for the sugar cane crop. In general, it may be stated that the possibilities of more intensive agriculture in the United Provinces are now beginning to be realised and no question is of more importance and none is occupying the thoughts of the progressive cultivators more than the manurial problem. The near future will see an increasing demand for all kinds of nitrogenous manures.

(*e*) As has already been pointed out, general interest in artificial fertilisers has only recently been awakened. Much more investigation is required before the full effect of the various manures can be specified for the various soils and crops. Local trials combined with scientific study on experimental farms and in laboratories will gradually elucidate the problems as they are met with.

QUESTION 11.—CROPS.—Most of the crops of the Province are capable of considerable improvement, if the ordinary methods of the Economic Botanist are applied to them. Selection and plant breeding have already given excellent results with wheat, cotton, and sugar cane—the crops to which most attention has so far been devoted—and similar effort given to other staple crops, such as *juar*, *bajra*, barley, &c., would no doubt yield equally satisfactory progress. Improved cotton, wheat, and sugar cane has spread widely and rapidly over large areas of the Province and have given great financial benefits to the growers.

In answering Question 3, I have mentioned the extensive seed distribution organisation developed by the Agricultural Department. The work thus carried on is very valuable, but it absorbs much of the time of the staff. The maximum efforts of the department have only a gradual effect on the Province as a whole. Commercial agencies are required to take up the work of seed supply as is done in other countries. This would enable an improved variety to spread over the area suitable for it much more quickly than at present. Incidentally, it would relieve the staff of the department for other work.

QUESTION 12.—CULTIVATION.—Where canal or well water permits an intensive system of cropping, cultivators in many cases have been slow to realise that the change from the general custom of shallow ploughing would be an advantage. Experiments have shown much better crops can be obtained by gradual increase in the depth of the soil under cultivation than by shallow ploughing. The Sarda Canal will bring under irrigation large areas of land which previously depended upon natural moisture; this tract will offer a good opportunity for immediate introduction of deeper cultivation. Improvements already worked out at Shahjahanpur are available for introduction on a wide scale as soon as the necessary irrigation becomes available.

Much of the land intended for *kharif crops* receives very little cultivation before the seed is sown; little ploughing is done in the hot months of May and June except for the purpose of immediate sowing. As a result, the first rain at the beginning of the monsoon falls on a hard surface. If the fall is a heavy one, much of the water runs off the ground and quickly flows to the rivers; valuable moisture is lost and fertilising material and fine soil are washed from the field. It is of the greatest importance that this early rain should find its way into the ground on which it falls. This is especially important in districts of low rainfall where sowing is frequently delayed owing to the first falls of rain being light. If the surface were in a broken condition, sowing would be possible after a shower of rain which otherwise would scarcely penetrate the soil. Means for making ploughing before the rains possible and popular would be of great value to many of the districts of the Province.

QUESTION 14.—IMPLEMENTS.—Since 1914 there has been a marked rise in the wages of labour; there is also a definite shortage of working men

at busy seasons in some districts. As a consequence, a pronounced demand for machinery is arising in cases where the size of the holdings and the system of farming make paid labour necessary. The following are the most important requirements:—

(1) better ploughs, in order to reduce the labour involved in preparing a seed bed;

(2) extra power, such as oil engines for lifting water where the wells give a big discharge;

(3) threshing machinery, to set free man and animal power at the time when sugar cane, cotton, and other crops require attention, in the months of May and June;

(4) power-driven machinery for crushing cane;

(5) harrows, for cultivation in young growing crops such as sugar cane and wheat;

(6) machinery suitable for lifting water where the discharge is not sufficient to employ an oil engine economically.

To meet the above needs, much experimental work has been done and many useful implements are now on the market; but many problems still remain to be tackled.

There is no difficulty in procuring firms to manufacture implements and machines for which there is a demand, but the necessary private agencies for the distribution of the various things have not yet been developed. Lack of commercial agencies has made it necessary for the Agricultural Department to carry on almost the whole retail trade in agricultural implements. Attempts have at different times been made by various firms to establish local agencies, but so far such agencies have usually proved of little value and have disappeared after a few years, as the amount of trade done has not been sufficient to support them. As the demand increases, this difficulty will no doubt be overcome. By encouraging the local manufacture of the simpler implements such as small ploughs a certain amount of progress can be made. Local manufactures are better able to arrange for inexpensive local distribution. Firms at a distance must realise that it is not sufficient merely to sell an implement or machine; an efficient spare part service is essential and also an organisation for keeping the machines in good working order in the villages in the early days of their introduction.

Question 24.—Attracting Capital.—In order to induce men of capital and enterprise to take to agriculture it is first of all necessary to assure them that they can make a fair living by their undertaking. A landowner needs to be convinced that he will do better by cultivating the whole or part of his property than by renting it to tenants.

The policy adopted in the United Provinces of running demonstration farms on commercial lines and making them financially successful has had the effect of inducing a number of landowners to take up farming. I consider that cautious propaganda will result in gradual and valuable progress along the above lines. In the past, the difficulty of securing a compact area has prevented some landowners from starting their own farms. Recent tenancy legislation has helped to overcome this difficulty, and district officers can now do much to encourage landlords to farm some of their own land by assisting them in getting compact blocks. The Agra Tenancy Act of 1926 has created a new type of statutory tenant with a life-long lease of his holding. As a result, many landlords may think it worth while to experiment in farming, particularly when land becomes vacant at the expiration of the statutory tenancy terms, instead of allowing a new tenant to take possession.

The landless man of enterprise wishing to take up farming on a fairly large scale is now handicapped by the difficulty of getting land.

Oral Evidence.

34,311. *The Chairman*: Dr. Parr, you are Deputy Director of Agriculture in the Western Circle of the United Provinces?—Yes.

34,312. You have given us a note of the views which you wish to put forward. Would you like to make any statement in amplification of those at this stage?—I do not think so. I beg to remind you that I also wrote part of the memorandum. I may say that when I put up my answers to these questions, I added a forwarding note to the effect that most of the information given by me in answer to these questions had already been given in the "Report on Agriculture," prepared by the United Provinces Government.

34,313. Would you give the Commission the history of your own posts in India?—I have been Deputy Director of Agriculture of the Western Circle ever since I came to India, except for a short period of six months during this year when I officiated as Director when Mr. Clarke was on leave. Otherwise, I have been in the Western Circle the whole time, except for a few months when I first arrived which I spent in Cawnpore.

34,314. How long ago was that?—I came out in 1907. I was away for five years during the War; the rest of the time I have been in the United Provinces.

34,315. Would you give us an indication of the extent of the Western Circle?—It comprises roughly two Divisions, the Divisions of Meerut and Agra, with a small area of one or two hill districts. I may say that originally it also comprised the Rohilkhand Division, but as we developed, that was cut off and made into a separate circle.

34,316. You have had a long experience in the Provinces. Would you tell us your views as to the services which Pusa as a central station has rendered?—As an Imperial station, I think it has done extremely little for the United Provinces. We have been benefited from the work on wheat, but I think we benefited from it, to a great extent, because the soils of our eastern districts are very similar to those of Bihar and Orissa, and it was a local investigation almost, as far as we were concerned.

34,317. How about sugarcane?—We have benefited from that very greatly already, and the prospects are extremely good. The Coimbatore canes in my circle are extending almost more quickly than I can provide seed, and the prices the people are willing to pay for seed are extremely high. But, of course, we do not want to go too fast; we want to prove that the canes are really going to be good.

34,318. Sugarcane breeding is in a position which is different from that of any other crop, because of the fact that you cannot breed cane in these latitudes?—I think if the work could be carried on in the United Provinces, we should make even more rapid progress than is being made at present, and I understand there are prospects of that being possible. I understand that there is a possibility that under hothouse conditions one may hope to breed sugarcane in Northern India.

34,319. Have you any indication as to whether that is likely to come about?—I read about it two years ago in the Pusa reports; they were hopeful.

34,320. Turning to the substance of your note and your answer to Question 1 of the Questionaire, on page 93, you are dealing with the selection and plant breeding work that has been carried out. Did you hear the evidence that Mr. Clarke gave yesterday?—Yes, I did.

34,321. Do you agree with Mr. Clarke that the results now being obtained in rice, cotton, barley, oil seeds, fibre crops and potatoes are disappointing?

—I am not in a position to say that. The results are more or less preliminary at present, and only one in close touch with the work could express an opinion on it.

34,322. Further down on the page you say, "As the public awakens to the possibilities of agricultural improvements there will, no doubt, be a demand in the Legislative Council for the expenditure of much more money on the Agricultural Department." Do you see signs of a quickening interest in agriculture?—Yes, very great. Mr. Clarke is in close touch with the Legislative Council; he gave figures yesterday showing the very rapid increase.

34,323. How about the position in the districts that you know well, from the point of view of public interest?—It is greatly stimulated, and the way to stimulate it is by success, and no other way. It is stimulated because we have been successful, and only to that extent, in my opinion, is it stimulated.

34,324. Is there cotton in your circle?—Yes; mine is the centre of the most important cotton growing tract.

34,325. What is the principal pest that you suffer from?—The boll-worm.

34,326. Is the officer from the United Provinces, who went to Egypt to see what is being done in that country in relation to this pest, still in Egypt?—He has come back.

34,327. Was that investigation valuable?—Yes. I think it is very valuable. In Egypt they have advanced further than we have, in that they have already started methods of control.

34,328. Do you know whether he saw what was done in the Soudan?—I have not seen his report, but I think he did. I had a conversation with him, but I do not remember that point now.

34,329. *Sir Henry Lawrence*: Who was that officer?—Mr. Richards. He is now acting Principal of the College.

34,330. *Professor Gangulee*: Has he submitted any report?—I do not know. He told me just when I handed over charge that he was writing a report, but whether it has come in or not I cannot say. A certain amount of information regarding his general conclusions is contained in the United Provinces "Report on Agriculture."

34,331. *The Chairman*: You give us an interesting account of the demonstration and propaganda work being carried out by the Government, and we had full evidence on that yesterday from Mr. Clarke. Do you feel that from the research side you have been supplied with a sufficient number of new varieties of sufficient quality fully to employ this propaganda machine?—I think an improvement obtained by the research side is of very great importance, but in a few years it becomes known, and at present I am rather inclined to think that unless more research is done, within a few years our propaganda staff will outstrip the research staff.

34,332. That is the impression which I had formed?—I do not think it is the case at present. After all, we have covered only a part of the Province, and although we have introduced improvements in certain districts, there are many other districts that still require tackling with regard to those problems.

34,333. Would you agree that it follows from that that it is very important that the research side should be a stage ahead of the propaganda side?—Yes; I am in favour of strengthening our research side.

34,334. Do you have any difficulty in getting demonstrators to live in the villages?—Not at all.

34,335. Merely a matter of discipline?—It is a matter of getting the right type of person. If you get a person who is too highly educated and highly paid, he is not inclined to live in the village, except as a supervisor; he does not make the best demonstrator.

34,336. On page 94 in your answer to Question 3, you say "The established practice of the department is to start the demonstration of some form of intensive cultivation when a tube well has been completed. Under a scheme recently sanctioned, owners are granted part of the cost of new installations in places where the department requires facilities for demonstration or seed production, if they undertake to lease small areas of land to Government for a term of years and to supply water at fixed times and rates." Is it only in cases where the department proposes to make use of the land and irrigation for demonstration purposes that the grants are given?—Yes. At the same time, the general grant of assistance in the form of free service is given to every tube well. This is a special money grant. Yesterday, this question was raised, and a total subsidy of Rs.6,000 was indicated. I think the whole of that in the statement is a subsidy in the form of services rendered by the engineering staff.

34,337. Would you look into that?—I think I can clear up the point. In many cases, in addition to the ordinary subsidy given in the form of free services, when we pick out one of these men to help us he is given a cash subsidy from the Agricultural Department of Rs.2,000 or Rs.3,000. So there is a general subsidy to everybody in the form of free services, and in addition the men we wish to help are given a cash subsidy of Rs.2,000 to Rs.3,000, or less. I rather think that is not included in those figures; that was my impression yesterday. We have a total amount of Rs.6,000 mentioned in Mr. Clarke's evidence.

34,338. Can you tell the Commission in how many cases this further subsidy for services promised in the matter of demonstration has been given?—I think that is given in Mr. Clarke's evidence. I was reading it last night and it is mentioned somewhere.

34,339. Are not all these subsidies for tube wells?—Some them are for tube wells, but some are given to ordinary producers who have no tube wells.

34,340. *Sir Henry Lawrence.*—Two hundred tube wells with engines and pumping plant have been completed?—I think the number subsidised is 35 of both tube well people and people without tube wells. This is a system which has been running for two years now.

34,341. *The Chairman*: But it is quite clear that the subsidy on account of the undertaking to help in propaganda is a cash subsidy over and above the assistance in services rendered in constructing the tube wells? —Yes, cash paid to the man on an agreement.

34,342. At the bottom of page 94, in answer to Question 3, you say that gradually it will be possible to deal with organised bodies of cultivators in the form of agricultural associations. Is there any improvement of that sort yet?—I am afraid there is not much, but a few associations have been formed. Probably out of every three that are formed one survives for a period and the others disappear. I think that is the most unfortunate feature of our work; there is not sufficient enthusiasm to carry on the work by local bodies.

34,343. Is not your sentence there a little optimistic?—At the time I wrote this I felt that much could be done by organising some sort of district development committee and I still hold that something can be done. We have at present special committees of the District Board. When they are made up of enthusiastic agriculturists, they help us considerably. Many

schemes, as Mr. Clarke pointed out yesterday, have been carried on by them and I think we must look forward to that form of non-official help developing.

34,344. I think these committees of local bodies depend to a very large extent on the lead of one or two enthusiasts?—They do. If we could get eventually rings like rural councils or *tahsil* associations made up of men actually engaged in the work; for instance, if we could combine ten men running tube wells and making money out of agriculture into an association, we could approach them as a body instead of individually, and it would be a good thing.

34,345. You have no village group or *tahsil* association at all?—There are a few.

34,346. On page 95, in answer to Question 4, you say that the procedure followed by the Indian Central Cotton Committee seems to you an excellent one and could, you think, be copied by the Government of India with advantage. What exactly had you in mind when you wrote that?—My idea is that research has to be carried on by the Provinces. It has to start as a local effort. We have a large number of problems that require tackling, and in so far as we are not able for financial reasons to tackle these ourselves, I think the Government of India, if funds were at its disposal, could help us in the same way as the Indian Central Cotton Committee; when it was formed, it wished many problems to be investigated which the Provinces were not in a position to take up, and it was willing to finance the investigation of those problems.

34,347. The Indian Central Cotton Committee is an instance of the organisation of research by crop rather than by area?—It is by crop, but it finally comes down to doing that investigation provincially; it is localised investigation. The question requires answering in two parts. First of all my opinion is that investigation must be begun locally and probably it may branch out eventually into being an investigation which influences more Provinces than one. Secondly, as to the financing of that investigation. I think funds will have to be under the control of the local people who are doing the investigation.

34,348. What was your own training?—I took an agricultural course in Edinburgh and then I went to Germany, and from there to America. I took my Ph.D. in Germany and an agricultural diploma at an American agricultural college. I went to Leipzig in Germany and to the Iowa Agricultural College in the United States of America.

34,349. Did you study the working of the Departments of Agriculture in the United States?—Yes, I have always taken an interest in it. At the time I was there,, there was no federal research carried on in Iowa. All the research was being done by the State Government, and it got its funds by appealing to the local Legislature.

34,350. *Sir Thomas Middleton*: What year was that?—That was in 1906-07.

34,351. The Hatch Act was passed in 1888?—We had to appeal to our legislature to get funds.

34,352. A grant from the central fund?—The Hatch fund was given them.

34,353. I was under the impression that every year there was a big campaign carried on to get funds just before the budget time of the Legislature?—That might have been so, but there was a large fund available for the experimental work of the State from the central exchequer.

34,354. *Professor Gangulee*: What was the main line of work in which you were chiefly interested in Iowa?—I was studying the method of animal breeding.

34,355. You did not carry on any work in plant breeding?—No, not at all. In Leipzig my work was concerned with soils.

34,356. *The Chairman*: On page 95, in answer to Question 7, you are comparing the difficulties in the matter of consolidation of fragmented holdings in the Punjab with your conditions in the United Provinces. You say your difficulties are greater. Would you explain that?—I think we have to deal with smaller people and people who are tenants and sub-tenants, whereas I am under the impression that in the Punjab a very large number of them are proprietors.

34,357. What is the depreciation allowed for in the case of a tube well?—About 9 to 10 per cent. I think it is given a life of ten to twelve years.

34,358. On page 97, in answer to Question 10 (*a*), you say that where water is at all deficient the cultivators are reluctant to use it in growing crops for which they get no immediate financial return. Under canal irrigation, I take it, a green manure crop which was irrigated would be charged for on the ordinary acreage basis?—Yes, it is on the ordinary acreage basis.

34,359. Do you think it pays the cultivator to apply green manure?—Yes, certainly, under conditions of irrigation. It is the only way I have been able to make farms pay. I could not have done it without green manure.

34,360. You say where water is at all deficient? Is not it rather where water has to be paid for?—No. The point there is they must use it to grow the crops which they depend on for their livelihood.

34,361. Both crops require water at the same time; both manure and other crops?—Yes.

34,362. Have you formed any firm idea yourself as to whether artificial fertilisers would pay on the irrigated land in the United Provinces?—I think they will pay, where there is more intensive cultivation. Prices are dropping now. It is entirely a matter of price. As a matter of fact, during the last year there has been a big change in the attitude of the manufacturers and of the consumers towards this question. There is a very large amount of private propaganda being carried on by firms interested in the sale of these manufactures, and they have carried out a large number of experiments in villages. I think we have arrived at a time when we can definitely recommend these manures.

34,363. You do not suggest that they would pay only in the case of garden crops? What do you mean by intensive cultivation?—They would pay immediately for potato cultivation, sugar cultivation, and so on. But I do not think they will pay for ordinary wheat cultivation where a low standard of cultivation is the custom; but where a high standard of cultivation is possible, where there is plenty of water, I think they will pay for wheat cultivation. I think at present there is quite enough ground to cover in devoting attention to sugarcane and potatoes; the demand will grow gradually from that basis.

34,364. Is potato cultivation increasing?—Yes, I think it is, though not very rapidly.

34,365. Where does the seed come from?—A very large amount of it is local seed. A certain amount of it is imported at different times from Assam and the hills.

34,366. Are there any particular tracts where seed is grown?—In the past one district of the United Provinces had a reputation for supplying good seed. Now that has become diseased and people have to look elsewhere for seed. We are encouraging them to go to places like Assam and also to get seed from Dehra Dun and the hill tracts.

34,367. Is any seed coming in from Europe?—If it is coming to the United Provinces, it is coming via the Bombay Presidency.

34,368. *Sir Henry Lawrence*: Do you get seed from Mahableshwar?—No. Our improved seed has been chiefly our own hill seed.

34,369. When you say you get it from Bombay, do you mean grown in Bombay?—I refer to private importation.

34,370. *Sir Ganga Ram*: Does it come from Italy?—Yes, but it does not come to us direct.

34,371. It is the same thing. It does come from Italy?—Yes, it probably does.

34,372. *The Chairman*: On page 98, in answer to Question 11, you express the view that it would be well if commercial agencies would take up the business of seed supply. Do you see any improvement in that direction?—Not much, except in so far as it has been stimulated by the grant given to private individuals by the Agricultural Departments. We hope that these farms which are subsidised will become pedigree farms and a source of pure seed. We are only too anxious to try and get someone of that description to come in who will carry on the work.

34,373. There is no suggestion of a monopoly in that case?—No.

34,374. Is it your view that reasonable profit could be made by the distribution of improved seeds?—Yes. In some crops we are deriving a large profit even at present.

34,375. On page 98, in answer to Question 12, you touch on the important problem of ploughing before the rains, in order to get moisture into the soil. Is it possible with bullocks to break the hard ground before the rains begin?—Yes, it is quite easily possible, but at the time the bullocks are busy; the climate is extremely hot and the ordinary man has so much consideration for his bullocks that he does not wish to use them for that purpose.

34,376. Have you any suggestions to make?—No. I think the most hopeful line of development is to make it possible for a crop to be grown at that time instead of having to plough the hard ground. Our aim is to try to increase our irrigated area so that there will be little need to plough before the rains.

34,377. At the bottom of the same page, in answer to our Question 14, you say there is a definite shortage of working men, in busy seasons, in some districts. Is that shortage of labour confined to particular areas?—Yes, I should say it is confined principally to the Western Circle which I know best; I should say it is not a fact as regards the East.

34,378. Then you say, as a consequence, an enhanced demand for machinery has arisen. Do you definitely associate this increasing demand for labour-saving machinery with those districts where labour shortage exists?—Yes.

34,379. Quite definitely?—Yes, definitely.

34,380. What labour-saving machinery is used?—We are using a lot of ploughs, and at present probably the most interesting and important problem is the question of threshing; we are just about at the stage when I think power driven threshers can possibly be introduced. The cost of threshing, on account of the rise in the cost of labour and the cost of cattle, has gone up considerably, and I think if we could get a machine which could thresh, at 4 annas a maund, we could compete with local methods.

34,381. Do you think it is necessary that there should be a chaff cutting machine?—It has got to be a *bhusa*-making machine.

34,382. That is essential?—Yes, absolutely essential; we have got several in the country, and I had one touring in my circle. One toured in the

Muzaffranagar district, and from my experience of that machine I am giving my opinion.

34,383. Whose machine was that?—It was a departmental machine. We travelled round the district to some extent, just the same as a threshing contractor would at home.

34,384. *Sir Ganga Ram*: Whose make was it?—It was Ransome's.

34,385. *The Chairman*: Did you adapt it or alter it in any way?—No, we did not alter it. A few years ago they sent out an engineer to study this problem, and this machine was made to suit Indian conditions, and it has, within certain limits, answered extremely well.

34,386. It stands the temperature?—That is the one thing it does not do very well; it does its work when it is in good order.

34,387. In a case of that sort, are you in touch with Messrs. Ransome?—Yes, in close touch.

34,388. Do you see any signs of Indian firms competing?—Not in machinery as complicated as that, but in all simple machinery, yes.

34,389. That is a very special line, is it not?—Yes, it is a very special line and the experimental work has been already very expensive. But small things like bullock gears and ploughs are being made in large quantities in the country itself, and can be made quite well.

34,390. You do not touch upon animal husbandry at all in your note?—No, that is outside my sphere.

34,391. But you told us you spent some of the earlier years of your life in studying the problem, and I have no doubt you have formed views on the subject?—Yes; my brother carries on the work in this Province, and we have discussed it fairly thoroughly at different times.

34,392. Is the fodder question a burning one in your area?—Yes, it is very, very important.

34,393. Is any fodder grown at all?—Yes, large quantities of fodder are grown as a cultivated crop, and, of course, in addition, the by-products of ordinary grain cultivation are very important, such as straw.

34,394. What is your own view about the silo as a contribution to this problem?—I think it is almost essential for dairying work; if dairying work is going to be developed, I think that is the only form of succulent food that the country offers, but for other types of animals, such as bullocks for working, I do not think it is likely to come into extensive use, because the ordinary cultivator has almost sufficient fodder in the straw from his crops.

34,395. Are you satisfied with the condition of the ordinary working bullock in the season of fodder shortage?—No, he goes down very much in condition, but it is extremely difficult to see how you are to cope with it; the man goes down too. At present it is a question of the value of fodder and the value of cattle as compared with the value of grain.

34,396. In your own district, is the population a meat-eating population or in the main vegetarian?—In the main vegetarian.

34,397. Is dairy produce consumed by the population?—Yes, to quite a large extent. My circle is probably the richest circle in the United Provinces, and more dairy products are consumed there than in any other circle.

34,398. Milk and *ghi*?—Yes.

34,399. Have you found that the families that consume dairy produce are better nourished and stronger, as a rule, than those that do not; have you been able to observe that at all?—I do not know that I should

care to say that; they are better off, and because they are better off, they are better nourished. When they can buy luxuries, as one might almost describe dairy products, they do buy them, because they think that is a very important item of their food.

34,400. Is the keeping of the cow by the cultivator a common practice in the district?—Yes, very common.

34,401. Are the milk yields very low?—Yes, they are low; the people who really want milk and milk alone keep buffaloes. The man who keeps a cow hopes to raise some milk and also probably to raise a male calf for his cultivation.

34,402. *Professor Gangulee*: Is the yield of milk decreasing in your experience?—I do not know that I would care to say that it is; but the yield of the animals is extremely low. With the exception perhaps of the Murrah buffalo, the individual yield is extraordinarily low. A very large proportion of the cattle are uneconomic from the dairy point of view and could not be kept if the only product was milk or some form of dairy produce.

34,403. *The Chairman*: Would it not be a great contribution towards the well-being of the cultivator if it were possible to provide him with a cow capable of yielding, say, 100 per cent. more milk, which, after all, is not a very ambitious proposal?—It would undoubtedly.

34,404. As well as providing him with a male working animal?—Yes, it would undoubtedly.

34,405. Have you any co-operative organisations in your district?—A very large number have been started and have died and have started again; a large number of ordinary village societies do exist in various districts.

34,406. Have you formed any view as to the soundness or the reverse of the co-operative credit movement in your district?—My experience corresponds with that of many people who gave evidence before the Oakden Committee, that at present we have not established it on a wide scale on a sound basis.

34,407. Is there any vigour in the primary societies in your district?—Only very occasionally.

34,408. Are the agricultural areas contiguous to forest districts?—To a small extent, not to any great extent.

34,409. Do you find the Forest Department reasonable in its attitude towards agriculture?—Yes.

34,410. Is there friendly co-operation between the two?—Yes. We do not meet very much; the districts are away in the hills; they are the districts we have touched least from an agricultural point of view.

34,411. What proportion of your circle is canal irrigated?—I should think probably 25 to 30 per cent. of it; 30 per cent. probably.

34,412. Are you in close touch with the Irrigation Department?—Yes, we are in close touch with them; I have to be to get water for my farms; otherwise I should get none.

34,413. But you do work in friendly collaboration?—Yes, we discuss everything in full.

34,414. Have you any system of local round table meetings between yourself and the Irrigation Department and any other department, touching the interests of agriculture?—We have a Board of Agriculture of which I am a member, and of which the Chief Engineer is a member.

34,415. That is for the Province; but have you anything in your circle?—We have Farm Committees which advise, and also to some extent control, the policies followed by the farms, and then we have District Board Agricultural sub-committees.

34,416. In spite of many difficulties, I understand that you do definitely form the view that there is an increasing demand from the cultivator for expert advice and assistance?—Yes, undoubtedly; when we have anything to give him we can easily find the men who are willing to take it.

34,417. *Sir Henry Lawrence:* On page 4 of your statement, you mention that farms are the centres of pilgrimage for large numbers of agriculturists from considerable distances. Do you keep any record of the number of people who come to see your farm?—No, not an actual record, but at certain times of the year, for instance, last year, when we were supplying sugar-can seed, large numbers came.

34,418. Do they come in tens, or hundreds, or thousands, or what?—In the months of February and March of last year there would probably be 200 passing through the farm in the course of one day.

34,419. That is in order to obtain setts?—Some of them, yes; and then also, for instance, at the time of a local fair, or at a time when there is any particular movement on that brings the agriculturist into that head-quarters, many of our farms that are near to headquarters receive very large numbers of visitors.

34,420. Do you keep any special staff whose duty it is to show these people round and explain things to them?—The Farm Superintendent is usually a very well qualified man; he has an assistant, and at times of rush some of the demonstration staff may come in, if necessary, to assist him. I do not think there is any lack of facilities to enable the people to see what they want to see when they come to those farms. For instance, at the time of a local fair, in addition to the ordinary farm staff, if we are doing demonstrations on that particular farm, some of the demonstrators from the district would be called in to help.

34,421. I did not quite understand your answer about the difficulties of work in the United Provinces compared with the Punjab. Is it the case that the tenants in the United Provinces have not the same incentive to improve their cultivation?—I think you misunderstood me; that was a question merely with reference to difficulties of consolidation of holdings, I think.

34,422. What is the effect of the form of tenancy here?—I think it makes it more difficult for us to consolidate holdings.

34,423. It is not the case that they have less incentive to improve their cultivation here?—I do not think so, no.

34,424. The tenant reaps the benefit from any improvement in cultivation?—Absolutely; no one else reaps any direct benefit from it.

34,425. Are these fertiliser firms who are now carrying on some propaganda English, Indian or American?—One big agency is the agency for the Chilean Nitrate Company.

34,426. What is its origin?—The great world-famous Chile mines in South America that supply nitrogen to every country in the world; they are just starting to develop their propaganda in India.

34,427. Is it an English or American organisation?—It is Chilean, I suppose.

34,428. *Sir Thomas Middleton:* International probably?—Yes, probably. And the second one is called the British Sulphate of Ammonia Federation. That is the second Company which has started work recently in the United Provinces. They buy some of their produce in Europe, and a certain amount is manufactured in the coal fields of India itself. Up to a few years ago I believe that that manufactured in India more than met the local demand, but as the demand increased importation began.

34,429. *Professor Gangulee:* But the British Sulphate of Ammonia Federation are not the manufacturers?—No, they are merely an agency.

34,430. *Sir Henry Lawrence:* You get sulphate of ammonia from Tata's Works?—It comes to us through this agency, and they collect it from Tata's and all the steel people in India. Exactly how they get hold of it through these people I cannot say.

34,431. Is there any purely Indian firm working in this?—All their local agents are Indian. In the last year or so they have engaged a large number of Cawnpore college graduates to do propaganda work, and in addition to that they have established agencies in very many districts.

34,432. You have passed a considerable number of diploma holders out of your College. Do you know if any of these men have set up as seed merchants or as implement agents?—I do not think that any of them are doing that business. None of them are seed merchants; in fact there is nothing of that sort in the country. Some are carrying on seed supply incidental to their farming operations. There are no such implement agencies.

34,433. By the expression "in the country" you mean in the United Provinces, I take it?—Yes, all I say refers to the United Provinces.

34,434. In Mr. Clarke's reply we were told on page 3 about the difficulty of the young officers getting experience in the work in respect of rice, cotton, barley and so forth. Has it been the practice here to send any of these officers to study what is being done in other Provinces?—They are allowed quite a lot of freedom to visit other Provinces. When I was officiating Director, quite a number went on tour to other Provinces to see what was being done there.

34,435. Is that the recognised practice of the department?—Yes, and I think it is a very, very important thing.

34,436. Can you state whether any one in particular went to study rice, for instance, in Bengal or Madras or Bombay?—Yes, the rice officer did go to Bombay at the time of the Poona Show, as far as I remember, with the idea of seeing the show and discussing rice problems with the Bombay people. Another officer went to Bengal chiefly on horticultural work.

34,437. But I suppose only to study conditions for a few days?—He went merely as a visitor in order to discuss things with a man who was doing similar work, and not with the intention of taking a course of instruction.

34,438. Have you ever seen the work in the other Provinces?—Yes, I have travelled in many Provinces. I was at Poona during the Show; that is the most recent visit I paid outside the Province.

34,439. You were regularly deputed by your Government to do so?—I was not deputed. I merely asked permission to go and it was given. Deputation is not the practice; it is very rarely done. But permission can be obtained by a man from his Director to visit another Province. That is the only formal procedure necessary.

34,440. Is that done by all the Deputy Directors?—It is a matter for the Deputy Director to choose. I could not say to what extent other Deputy Directors take advantage of these facilities. The facilities are there.

34,441. In this Report by Government it is stated that public attention has been much more attracted to the improvement of cattle than in former years. What particular form does that public interest take?—The present form that it is taking is the desire to get better bulls, and the willingness to pay prices that would not have been paid in the past. The officer in charge of cattle breeding considers that a primary line of improvement, that people should recognise that the present system of using any type of bull should cease.

34,442. Has this interest been awakened in all classes of the community, amongst the big landowners, small peasants and *gowalas*?—All classes of the community that live in the real cattle breeding tracts. Some of the United Provinces districts breed very few cattle, and cattle breeding is of too little importance. Some other districts are what one may call cattle breeding tracts, and in many of these tracts the officer in charge has been able to see a very great deal of interest aroused.

34,443. Is the dairy of any interest or importance now?—It is not of very great importance. The chief problem, so far as I am aware of the matter, is to place milk already produced on a market where it can be sold. The primary problem at present is, I believe, one of transport.

34,444. How is the transport done?—At present most of the towns depend upon a very small area surrounding the town for their milk supply. A small amount comes into town on the heads of coolies and a small amount on *ekkas*.

34,445. There is no organised supply by rail or motor, is there?—None at all. We are just starting to develop the matter of supply. At present there is absolutely no transport by rail.

34,446. Are you developing the motor transport?—I am afraid I am infringing on the domain of another officer who is going to be examined later on, because these are his schemes.

34,447. *The Chairman:* He is your brother?—Yes. He is developing a scheme of collecting and bringing milk in from a distance. A motor collects village milk and brings it to a centre at a considerable distance from the producing area.

34,448. *Sir Thomas Middleton:* You are responsible for chapters 2 to 9 of the Report on Agriculture?*—Yes.

34,449. In chapter 3 you give a very interesting account of the development of the Agricultural Department. I think we may regard the department here in the United Provinces as a pioneer, as you did more in the earlier days than possibly any other Province in agricultural education?—Yes.

34,450. You had a Director as early as 1876?—Yes.

34,451. When you were collecting the information for this chapter, did you come across any special reports or memoranda by the late Sir Edward Buck which would be of interest to us as a Commission?—I did not, but I knew Sir Edward Buck; he has stayed with me at different times. As regards this particular memorandum, I did not find any material.

34,452. I am wondering if he left anything on record?—There is a lot on record in the agricultural office left by him.

34,453. Because he probably gave more thought to this subject than any man of his time?—Yes. I think he was extremely interested in every form of agricultural activity.

34,454. The early development up to 1900 was really his development?—Yes.

34,455. It was in 1906 that you first enlarged the department substantially and you had an Economic Botanist appointed in the person of Dr. Martin Leake, and an Agricultural Chemist, Mr. Clarke. Then the first notable change in policy that we notice in your history was in 1913 when it was decided that the effort to train men for the Revenue as well as for the Agricultural Department should cease. That policy, I think, was laid down by Sir Edward Buck, and I am wondering if you could tell me what led to the change?—The impossibility of accommodating both types of men; I think I have put that in the note.

* Report on Agriculture in the United Provinces. (Not printed.)

34,456. It was not that the training given was found unsuitable for the *Kanungo*?—I think it was impossible to reconcile the different types of training required by the two types of officer, and we could not raise the standard of the agricultural college to the standard we wished if hampered by the training of a class of man whose training was not to be carried up to that height.

34,457. Can you tell me anything about the experience of the Local Government with these *Kanungoes* who were trained at the college in the earlier days? Were they notably better in their work than the others, or the other way about? Mr. Clarke yesterday suggested that some should be reserved appointments in the Superior Revenue Service for Cawnpore students?—I do not know that I can express an opinion; I do not think I have ever heard that discussed. They are a small number after all, in relation to the total number at present working in the Province.

34,458. Then you made a further rapid move forward in the period immediately after the War, and it is since that period, I think, that you have employed an Entomologist?—Yes. Of course, recruitment was stopped during the War and that was an accidental break in our development. It was not that the Entomologist was employed because of the increase of interest displayed. He was a necessary member of the staff to be recruited as soon as funds permitted and men were available.

34,459. The intention to appoint him existed in 1914?—Yes.

34,460. In paragraph 104 of the Report on Agriculture, you refer to the success made of these demonstration farms that have been run on commercial lines. How many of these commercial farms are exclusively dry crop farms?—A very, very small number of them. I think I would be safe in saying none at all. There are none in my own circle.

34,461. How many of them are cattle-breeding farms?—Cattle farms are not run on those lines.

34,462. So that the commercial success at present is being achieved entirely under irrigation and intensive cultivation?—I might say, as regards cattle breeding, we do not think that any private farm can be run as a commercial success. It is not a commercial proposition to breed cattle on a large scale at present in the United Provinces.

That is what I expected you to say.

34,463. *Sir Henry Lawrence*: Why?—The cost of raising them under ordinary cattle farm conditions is higher than the money you can get for them. Where they are raised at present, a very large number of cattle are raised by a subsidy in the form of free labour and feeding; one might almost say that it is often free food, in that no charge is made for it, and it is of very little value. When you bring everything on to a balance sheet, and calculate what amount of cash you would have to pay for the labour that is at present given free by the women, and other things, you will find that you are down every time.

34,464. What is the present price of a pair of bullocks?—A really good pair of bullocks, up to our first class standard, would be worth about Rs.350.

34,465. What would be the price of a normal cultivator's pair?—In my Circle, you will find with the cultivators plenty of bullocks worth Rs.350 a pair. They go up to the Punjab fairs and our own fairs and pay that price for them; many of the rich Jats in the western districts of the United Provinces have bullocks worth Rs.350 a pair. I buy them in competition with cultivators of my own district.

34,466. *Sir Thomas Middleton*: There are very few such bullocks bred in your district?—There is a certain proportion, but quite a large number of those bullocks come from the Punjab; they are the high type of bullocks.

34,467. But the percentage of bullocks bred in your own district would be very small indeed?—The percentage of bullocks bred in my own district would be small.

34,468. There is another interesting point which you make in paragraph 131 of the Report on Agriculture, relating to the deterioration in sugarcane. Has that been noticed markedly in the United Provinces?—Yes; in my own farms it is noticeable every year with regard to imported varieties of high yielding quality, but of course some of the selected varieties do not deteriorate. Some of the varieties that we have introduced live and prosper for perhaps eight or nine years, and then we find that there is a deterioration. At present we are finding that we can make them live a little longer by getting setts from the hills.

34,469. Can you give me any idea of the rate of deterioration? Is it a case of yielding well for two or three years and then a sudden drop?—With regard to the particular variety I was thinking of, it was probably not until twelve years after it was imported that it showed signs of deterioration. It was imported from Mauritius.

34,470. The rate of deterioration is slow as compared with potatoes, for example?—I think that is rather a dangerous conclusion to come to. For instance, at present we have new varieties of Coimbatore canes, and some of our imported varieties are rather showing signs of a disease that we have not been troubled with in the past. It is mosaic disease, and just how quickly they are going to deteriorate on account of mosaic disease I can only guess. I can only hope for the best.

34,471. Could you tell us something about your experience with your hill-grown cane setts? When they come down, do they appear to you to be completely rejuvenated or only partly?—You cannot say anything from the setts.

34,472. From the crop?—What I have been doing for the last few years is to get seed of a variety grown by private growers in the hills in my own circle, bring it down to my farm and grow it on my farm alongside of cane of the same kind which I have been growing for the last ten years; I find that the difference is extremely marked.

34,473. You have got no definite evidence on this point up till now?—I am not too sure that Mr. Clarke, from his experience of the Province, agrees with me on that point. He has got a sugarcane station in the hills definitely set aside for this type of work of a variety; and I think you may find that the reaction to hill treatment is entirely characteristic. Some varieties may show this deterioration and rejuvenation and some varieties may not. The variety that I am referring to is not grown very much by Mr. Clarke.

34,474. You referred to the fact that there may be some disadvantage from having to breed canes in Coimbatore. In reply to a question, you said you thought that even better results would follow if you could raise them entirely in the United Provinces. Can you tell me at what stage it is safe to grow seedlings in the United Provinces? Could you grow one or two year seedlings from Coimbatore?—I could not tell you that. I think they send them to us in fairly early stages. I think their practice is to send to a Province quite sufficient material of the type suited to that Province; but I do not see why there should be any difficulty about growing safely one or two year seedlings from Coimbatore.

34,475. The point is this: the Director of the Cane-breeding Station at Coimbatore could send you Coimbatore seedlings; if you got them in the early stages, you could judge how they would be likely to do under United Provinces conditions?—That is my suggestion, that work could be more successfully carried on in this Province.

34,476. It is not necessary to grow the seed; what is wanted is to grow the seedlings under United Provinces conditions?—Yes; under these conditions the early elimination and the routine work could be reduced.

34,477. You have expressed the view that there was the danger that propaganda might outstrip research. Were you thinking mainly of such crops as sugarcane and cotton?—Take sugarcane for instance, and the rate of progress that we are making with the Coimbatore canes in my circle. In 1921 a few seers of Co213 came up to my circle in the United Provinces. Last year, from the Government farm and some of the local farms which are not under our control but in which we take an interest, we distributed 70,000 maunds grown from the original few seers. At present there are 5,000 acres under this variety in the United Provinces; in the next year there will be 50,000 acres at least, and I think the rate of progress will be so rapid that, unless something unforeseen occurs, in my circle 400,000 acres will be under it shortly.

34,478. A good thing requires no propaganda?—No. Anything which increases the yield by 100 per cent. requires no propaganda in any country.

34,479. With cotton your experience is very different? It is a slow business there?—Yes; it is chiefly a matter of organisation with cotton. If you grow sugarcane, it is there for the people to come and take. With cotton you require a special and complete organisation to keep the type pure.

34,480. What you had in mind was that you needed to find good new varieties? If you get them, they will attend to their own propaganda?—For instance, if a man can push four good things at present, he can equally well push twenty good things. A man who has to introduce twenty new things can do it in almost the same time as he requires for four.

34,481. In this Province, have you experienced trouble in threshing wheat clean with machinery?—The chief trouble I have had is a certain percentage of broken grain.

34,482. It is with a high speed drum?—Yes. If you are going to sow the seed, broken grain is a drawback. As most of our seed is for sowing, it is a drawback; I have to take measures to clean it, which involves a certain amount of loss.

34,483. You said that you yourself were not responsible for the cattle breeding work; but I think you have paid a good deal of attention to cattle breeding?—I have always been interested in animals very much.

34,484. You do not find that there is much difficulty in getting the cultivator to use good bulls?—We are just arriving at the stage when he is appreciating the value of good bulls.

34,485. Has he got to the stage at which he recognises that the progeny of a good bull requires a little extra attention?—I think so. Once he has got an animal that is valuable, he is prepared to give it attention.

34,486. How much milk do the cows in your district yield?—They vary; they give anything from 2 to 6 seers.

34,487. How much does the cultivator allow the calf?—He would allow it probably half of that, but it would vary tremendously. In the real breeding tracts a lot of cows are not handled at all. The remark that I made previously refers to the man who keeps his cow tied up.

34,488. I was referring to the class of cultivator in your district. What we have found in other parts of India is that cultivators who may be using good bulls are prepared to do nothing for the calves?—I do not think that is the case with us, because I have seen calves that have been raised from these cows and the Government bulls, and the improvement is marvellous. Not only is there greater bone development and a greater frame, but they show signs of very great care.

34,489. Do the cows have any grain fed?—A certain amount of stuff like cotton seed and *juar* and a certain amount of gram occasionally.

34,490. Even in those cases where cultivators are rearing calves but not keeping cows for the supply of milk. I was then referring to the rural open grazing grounds where they run free. Some of those cattle are not handled from year's end to year's end.

34,491. *Raja Sir Rampal Singh:* Is there any co-operation between the co-operative societies and your department?—There is co-operation to the extent that we are able to co-operate, but there is not much, because they have not advanced to the stage when they can be of much help to us. At present, they are engaged in lending money, and they are not in a position to control any of the activities that we think might fall within their Province.

34,492. Do you think that, if there be greater co-operation, there is much scope for propaganda work through them?—I do. I think there is very great scope, but I think it is a mistake to load extraneous work on to them until they are in a position to justify their existence by making a success of their primary object, which is to lend money to their members.

34,493. Supposing these co-operative Inspectors get some agricultural training, would it be conducive of much good?—Yes, undoubtedly.

34,494. Do the Government bulls reach the villages also?—Yes. Our present policy is to concentrate on certain areas and fill those areas with Government bulls and exclude all other bulls entirely, rather than to distribute our bulls indiscriminately over the whole Province, and in this way to convert those limited areas into big breeding tracts from which we can later draw cattle for the rest of the Province.

34,495. If such a procedure is adopted, how long will it take for improving the cattle breed of the Province?—Of course, it depends entirely on the number of controlled areas we can get into our hands. I think there is no reason why in ten to twelve years' time the whole Province should not feel a very strong effect from this work.

34,496. Would not things improve if the selection of calves was made in the village itself?—That is really the principle that we are working on; only we are going one step further back and making sure that the calf is a pedigree animal. We are putting these bulls into these approved breeding areas, hoping to exclude all other bulls eventually, and then when a good calf is bred in that area we hope to get that calf at a price and pass it on to a district where no good bulls exist. We are doing exactly what you suggest and going a step further back and making sure our animal is not a freak, but a pedigree animal; namely, we want to know its parentage. I believe they are going to keep records of this.

34,497. Can we not get the calves of indigenous tribes castrated in villages so that if some steps are taken to make a good selection some improvement might take place? At present we find cattle are deteriorating? —They are undoubtedly.

34,498. Gradually when we get some bulls from your breeding farms, they may be introduced?—I think you are working on absolutely right lines.

34,499. In your Circle, I believe there are Jats who are cultivators?—Yes, some of the best cultivators are Jats.

34,500. Is it a fact that Jats are better cultivators than other people in other places?—Yes, it is a fact that Jats are better cultivators than *Thakurs* and Brahmins in other places.

34,501. You officiated for some time as Director of Agriculture. Did you find similar improvements in other circles?—I think the circles that

have been in existence for some years are showing great progress. For instance in the Central Circle and the Shahjahanpur Circle good progress is being made. I did not become well acquainted with the circles farther south; I did not have much time to visit them. There is a lot of room for improvement in the recently created circles.

34,502. In what respect?—In bringing large areas of land under cultivation and introducing hardier varieties of crops. Some of the hardier varieties of sugarcane might succeed there.

34,503. Do these improved varieties begin to deteriorate after some time? I mean to say, if we get Pusa wheat and then sow the same wheat again, it begins to deteriorate?—I do not think it deteriorates, provided you make arrangements for a supply of pure seed; but at the same time, I think, in some cases where the soil is not suitable, deterioration can take place, and I do not think we can say a variety is properly established because it has been tried and been successful for one or two years; it is not unlikely that in ten years it may deteriorate. At the same time, a temporary improvement while we are looking for something better is the line of development. It is difficult to say what the length of life of these improved varieties of sugarcane may be. They may deteriorate, but if they do we have an organisation for introducing something quickly in their place. We are on safe lines there.

34,504. As far as wheat is concerned it is a general idea amongst villagers that in two or three years Pusa wheat begins to deteriorate?—Yes. I really do not understand what that is based on, because I have tested it myself on my own farms and found no difference in yield, taking wheat that came to me in 1910 as compared with that imported in 1924. I have found no difference. I rather think that in many cases there is something that is not understood in this question of deterioration of Pusa wheat. I certainly have not found it to occur.

34,505. Do the cultivators think that the Pusa wheat requires much more watering than the *deshi* wheat?—That is not my experience.

34,506. Three times as much water?—No. Of course these investigations are local, but in my circle the opposite applies. I should say Pusa wheat ripens on less water than the *deshi* varieties. It ripens about eight or ten days earlier, and in that case you can get through in many years with less water.

34,507. *Sir Ganga Ram:* You open your remarks by saying that very little is spent on your department, only one anna per acre; can you also say what credit we can give you for your activities?—That is brought out here. We estimated it, when we wrote this report, at one million pounds sterling. It has been worked out in detail in one of these paragraphs. It was referred to yesterday.

34,508. What page is it?—If you will refer to page 33 of the Report on Agriculture in the United Provinces, paragraph 166, you will find it.

34,509. What I mean to say is that in the Punjab, for instance, the claim is made that American cotton has been introduced. Can you claim the introduction of a new crop?—Yes, Aligarh 19 Cotton. It is a variety that I am responsible for.

34,510. Does that give a greater yield?—Yes. It gives a yield of Rs.15 per acre more than the stuff it has replaced.

34,511. So many rupees more per acre does not mean anything because in some years the rate may be very low?—I mean it gives an increased yield of 20 per cent.

34,512. Is there anything else?—Sugarcane.

34,513. You mean Coimbatore sugarcane?—Yes. Before that Shahjahanpur 48 and several varieties were introduced.

34,514. Anything else?—Pusa wheat 12.

34,515. You admire Pusa wheat. In the Punjab we have discarded it altogether?—Yes, but your Punjab 8 wheat will not grow in the United Provinces at all.

34,516. Why?—It is too long in growing. We have some on our farm at Aligarh. I have tried it for years. It will not grow properly. Probably there is a difference in soil. For instance, we cannot grow American cotton, and for very good reasons.

34,517. That sort of general condemnation does not help. The soil on your farm may be bad. Have you tried it in different parts of the Province?—American cotton?

34,518. Yes, and Punjab 8?—Yes. It has been very widely tried. Your growing season is longer than ours, and that is the crux of the matter.

34,519. Is there any system in your department by which you can know what research is going on in the sister Provinces?—Yes, we read your reports, and I frequently see your Director.

34,520. Is no sort of journal published in each Province in which the activities of each Province may be shown in the line of research?—All departments publish reports. There is this publication* that summarises things in general for the general reader.

34,521. Is there nothing in the nature of a journal in your Province?—No, not for the general reader. Reading is not popular amongst agriculturists in the United Provinces.

34,522. Is agricultural education included in this estimate of Rs.24·4 lakhs?—Yes, it is the whole budget.

34,523. You do not deduct the cost of agricultural education from it?—No. It is included; roughly it comes to 4 lakhs, I think.

34,524. You said something about threshers; I can give you some information. We have tried Ransome's and Marshall's. These threshers were really designed for English wheat, taking out the seed and leaving the chaff behind. They put on a chaff cutter with it to cut the chaff into small *bhusa*. The result of that is that when you cut with the chaff cutter it leaves sharp points which are not eaten so voraciously by cattle as with the other system, and then they introduced bruising with the chaff cutter. Bruising was not a success. Could you say it has been a success anywhere?—I say that the only reason why it has not been successful is the cost. I think your point about the chaff being uneatable is wrong as far as my experience goes. Chaffing has never been any good in the United Provinces. We have never attempted it. Bruising has always been our principle. At one of the biggest farms we use a big bruiser, and our bullocks have lived on nothing else but *bhusa* for ten years.

34,525. Perhaps they could not get anything else?—They are in very good condition.

34,526. What is the cost of threshing under this system?—In 1923 I was unable to reduce it below about 8 annas a maund. I think I can now manage it at 6 annas.

34,527. And does that include the cost of moving the machine from one place to another?—Yes; the driver and everything.

34,528. You could bring it down to 6 annas?—I hope I shall be able to do so. I cannot state it as an absolute fact; I am hoping.

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* Report on the Administration of the Department of Agriculture, United Provinces. (Not printed.)

34,529. We have made a trial of tractors in the Punjab. They sent two tractors to my village, and we tried hard and gave it up?—You are the pioneers; we are only followers in the footsteps of the Punjab.

34,530. When you use the words "intensive cultivation" do you mean to include fruit growing as well?—No, it did not occur to me at the time. I was referring to ordinary field cultivation.

34,531. By intensive cultivation you mean only vegetable cultivation?—No, I mean sugarcane and potatoes.

34,532. Anything else?—High types of wheat, but particularly sugarcane and potato.

34,533. Did you observe that in Pusa 12 the whole crop lodges? It does not stand the wind and that sort of thing?—I dare say, in your canal colonies.

34,534. We have given it up accordingly?—But our conditions are very different. We do not raise such enormous crops as you do in your canal colonies.

34,535. Are you aware of the fact that your Province is not quite immune from famine? Under the Famine Commission's law you must have ·4 per acre per head protected, while you have only ·2 as yet?—We look upon ourselves as immune except from fodder famine.

34,536. Do you produce enough grain?—I think so.

34,537. It is not a question of opinion. Have you studied the figures of imports and exports?—I cannot say. I cannot express a very definite opinion at the moment.

34,538. Do you import a lot of wheat from the Punjab?—Not every year. The re-exports make up for that in normal years.

34,539. Have you studied the imports and exports of your Province?—I have not made a special study of them; I have studied them from the point of view of my own interest, but if you asked me to quote figures, I am afraid I could not do it.

34,540. Are you in a position to classify the yields which you give in this statement, showing how much is canal, *barani* and well irrigated?—I looked into that last night; the explanation is a very simple one. The figures are irrigated and unirrigated taken and averaged.

34,541. Pardon my saying so, but when you strike an average you make a mistake?—If you refer to the last column of that table, you will see immediately the object of it; it was merely put in to give the Commission an idea of the value in money of some of the crops that we grow.

34,542. There is a fallacy again when you refer to the money value?—I should like to know what the fallacy is.

34,543. Prices may vary in any year, and therefore the money value is no consideration?—But the year is quoted.

34,544. Give us the quantity?—You can work it out; you only have to work it back from rupees and yields per acre. The yields and values for the year are given. It was worked out in my office for the benefit of this Commission at the wish of the Government, to give you some idea of the value of some of our crops.

34,545. I ask that that column should be divided into three showing the canal, the *barani* and the well irrigated?—We can give you that; that is the normal method of our statistics; they have been condensed in this table merely to arrive at the figures given in the last column.

34,546. Then you do not give a true figure, because I tell you you stand about fourth among the Provinces with regard to yield?—Then there is all the more room for improvement.

34,547. *Professor Gangulee:* Do you include the improved varieties?—No. The way these estimates are arrived at is by cutting what is looked upon as a normal crop in a village; that is what we call our standard yields, which are revised, I think, every five years. Let us suppose the standard yield of wheat is 800 lbs. covering a period of five years, from 1920 to 1925. The final yields are arrived at by crop estimates, *patwaris'* returns, and so on, showing what the yield that year will be, for instance, 80 per cent. of the normal; the yields are given as percentages of what we look upon as being the normal yield.

34,548. Is that the yield from the improved areas?—No, no improved areas are included in these at all; this is supposed to be the ordinary cultivation of a village.

34,549. *Sir Ganga Ram:* Is there still in your Province a sentiment with regard to the use of buffalo calves for agricultural purposes?—Not a very serious one.

34,550. I ask that question because there is an enormous trade between the Punjab and this Province; owing to this prejudice, your male buffalo calves are bought very cheap, for Re.1 or Rs.2, and are sold in the Punjab?—No, there is a very large number of them employed in the United Provinces.

34,551. I am glad to hear it, because this practice has led practically to the throwing away of part of your calves?—If one investigated the matter, one would find that they are employed to a great extent by the lower castes.

34,552. But there is a very large trade in your buffalo calves which go to the Punjab and are sold in the cattle markets?—In the United Provinces at present every sweeper who is carting bricks is using a buffalo.

34,553. But none are used on Persian wheels?—No, I do not think they are.

34,554. *Raja Sir Rampal Singh:* There is still a feeling among the high caste people?—That is so among the high caste people.

34,555. *Sir Ganga Ram:* When you bore a well, what permanent fixture do you put at the bottom? What measures do you take to prevent the sand getting in?—I do not know.

34,556. Do the Irrigation Department charge you for water that is used for green manure?—Yes, we are paying water rates on that at present.

34,557. It has been remitted altogether in the Punjab?—Yes, I think we might follow your example with advantage. Is this method of green manuring spreading very widely in the Punjab?

34,558. Yes, it is.—What are you using?

34,559. They generally use sann hemp. There is a remark in the report of the Irrigation Commission that in the United Provinces the Irrigation officers pray for drought so that their canal water may be taken; is that so?—I hope not. You had better ask them about that; I should not like to express an opinion.

34,560. The people of course wait for the rains?—Yes.

34,561. But for the purpose of sowing sugarcane, which is the chief paying crop here, you require water before the rains?—We want many waterings.

34,562. You require two waterings before the rains?—We require four in some places.

34,563. Then what method do you employ?—Most of the sugarcane grown on canal irrigation we water from canals.

34,564. But there is none to be had from canals in March and April?—That is when our best supplies are available: in April and May.

34,565. Then how does this remark apply, that you are always praying for drought?—If they do pray for drought, they are going to make the money in the *rabi*; that is when most of our irrigation is done.

34,566. Do people hesitate to take canal water?—Yes, in years of drought the area under irrigated *rabi* crop is much increased.

34,567. How much delta of water do you consider is required for *rabi*?—It varies in every district; in the west of the Province in a normal year, when the rainfall is 30 inches, 9 to 12 inches of canal water is required for wheat; that is three irrigations of 4 inches each.

34,568. Besides the water that is required for sowing?—We do not water for sowing normally; we sow on the rains.

34,569. Then 9 inches more rain would mature the crop?—In certain districts. In Muzaffarnagar 9 inches in a normal year will probably mature the crop; in Aligarh you want 12 inches; in Agra you want 15 inches.

34,570. 15 inches is the highest?—I should think that would always do it in a normal year.

34,571. How much water is required for maturing sugarcane?—It varies; in Aligarh, for instance, I very often give eight waterings, and in Muzaffarnagar probably five.

34,572. Besides the rainfall?—Yes.

34,573. Supposing there were no rainfall at all, how much would you require?—I should say probably about 55 inches.

34,574. 55 inches for sugarcane?—Yes, probably.

34,575. How much for paddy?—I do not know much about growing paddy.

34,576. Is there not much paddy grown here?—Not in the west.

34,577. I do not understand your statement that the subsoil water flows approximately at the rate of one mile an hour. How did you ascertain that?—I took that from a paper written by a former Chief Engineer of Irrigation in the United Provinces, Mr. Hutton; he condensed a lot of information on this subject from various authors. It was a paper contributed to the Agricultural Journal of India in about 1917; the exact reference is given in the memorandum.

34,578. You say also that the subsoil water is replenished each year to the extent of 12 inches?—Yes, that is averaging the total rainfall over the United Provinces.

34,579. What delta of water do you consider is lost by evaporation?—I I think that particular paper gave it at about 20 to 25 per cent., as far as my memory serves me.

34,580. That depends also on the humidity of the atmosphere?—Yes, it depends upon the district very much.

34,581. What proportion of the irrigation water is absorbed by evaporation, how much is used in sustaining plant life, and how much goes into the ground?—I do not know; I could not even attempt an answer to that question.

34,582. In the irrigated area is there a tendency for the water to rise in the subsoil?—Yes, in many districts the rise is very marked.

34,583. Do you think it would be approximately 12 inches a year?—It is cyclic with us; we are now passing through a period of year when the water level has risen considerably.

34,584. Has your Department investigated the level at which it begins to flow towards the river?—Yes, Dr. Leake wrote some very interesting papers on that twenty years ago.

34,585. But are his statements correct?—I think that is fairly correct; I think that is accepted.

34,586. There are no investigations going on now?—Yes, the Irrigation Department has got an enormous number of records on that particular subject.

34,587. Have you arrived at any solution of the problem of *usar* lands?—No; I worked on it for twelve years and then gave it up.

34,588. We have already found that by the use of little cross drains we can grow cotton on such land?—Your *usar* land is entirely different from ours.

34,589. Why?—You can hope to drain your land, but we cannot because it is, as it were, enclosed in a bucket.

34,590. Does draining do no good?—I studied this problem of draining for very many years; the quantity of water required is enormous.

34,591. It is only impregnated with sodium salts?—Yes, but that sodium has got to go through the bottom of a bucket.

34,592. We have found that cotton does grow? In my own village I have tried it with success?—I have grown rice and barley on this land. I have grown very good crops of rice and barley, about 20 maunds to the acre, but I would not like to tell you what was the cost of growing it.

34,593. You think that constant ploughing does not improve it?—I do not think so. There are some experiments going on in the east of the Province and I do not think that constant ploughing has improved it.

34,594. What class of potato is grown in your Province?—We have imported a very large number of English varieties into the hills, and some of these varieties have done fairly well in the plains. I have grown them myself and I found them doing fairly well.

34,595. Do you grow onions?—Not on the farms.

34,596. Is there any special attempt made to grow onions?—Yes, round the cities they are doing it.

34,597. *Sir James MacKenna*: With reference to these crop statistics and the question of improved varieties coming under them, I take it that the position is that these improved varieties will not come into the crop estimate of average yield until they have become so general that they become the normal crop?—Yes, it is a matter now of deciding that question. I think we might begin to think whether they ought not to be included. At present we are only just beginning to get *patwaris'* returns of improved crops. Two years ago we were getting none, and last year we got only a few.

34,598. Gradually, as you extend the improved varieties in a particular area, that would naturally come into the estimate of the normal out-turn?—Yes.

34,599. But in areas where they were not to any great extent grown naturally you would accept the normal crop of the area?—Yes.

34,600. Where are you headquarters?—Aligarh.

34,601. You live on the farm?—Yes.

34,602. As a senior Deputy Director of Agriculture, I want to ask you what your views are on the functions of the Deputy Director of Agriculture? Of research and propaganda which do you think is the first duty of the Deputy Director? Are you doing any research work yourself?—I am doing a little. Since 1921 I have not been doing much because there is no time. I do not think that you can absolve the Deputy Director from either duty. He has got to carry on experiments, to try and solve his own local problems, and I am rather inclined to wonder whether it would not be a good plan to put a special officer in charge of experimental work.

34,603. Would you call him a crop specialist?—No, a Divisional Superintendent working under the close supervision of the Deputy Director. We have a scheme to introduce a man of that type.

34,604. Are you strongly of opinion that it is an advantage for the Deputy Director to live on one of the central farms?—I would not insist on his living on a farm, but he ought to be in a position to spend a lot of his time on it without travelling any long distances.

34,605. On page 94 you say, with reference to the extent to which the new seed is being distributed and propagated, that many lakhs of acres of improved varieties of crops are now being grown in the Province. Have you any accurate survey of these areas?—We have accurate surveys of one or two *tahsils*.

34,606. You will agree with me that these figures are difficult to get accurately?—Yes, but I think we will arrive at accuracy in the next few years.

34,607. Because the more consolidated the blocks the easier it becomes?—Yes.

34,608. These are extremely dangerous figures to draw inferences from, are they not?—Yes. If I were ever criticised for putting up those figures I should merely have to refer to the figures given in the departmental report for the year 1926 which show that in some *tahsils* an improved variety of crop has almost eliminated the variety which we are attempting to replace. And it only requires an inquiry to be made in that *tahsil* to find that those figures are not excessive. They are usually probably less than they ought to be.

34,609. Estimates of that kind probably err on the side of lowness rather than excess?—Yes.

34,610. No particular accuracy can be had on account of the difficulty of collection?—Yes, that is so at present.

34,611. Do you find any suspicion attaching to the method under which the departmental control runs small demonstration plots? Do you find any suspicion amongst the cultivators that the methods are not within their scope or that there is some particular magic about Government cultivation?—I do not think so. That used to be the case in the earlier days.

34,612. In answer to Question 10 on page 97, you raise the question of running demonstration farms on commercial lines. Of course that is a demand that has always been made on the Agricultural Department by public opinion. What class of farms can one reasonably expect to be run on commercial lines?—Of the ones that I have charge of, the smallest area is 20 acres and the biggest is about 140.

34,613. I was wondering what type of demonstration or seed farms could be run on commercial lines?—These are run as demonstration farms and they can be run on two lines of policy, (1) to make them pay to meet the wishes of our rulers, and (2) to try and give as much benefit as possible to all types of people in the district.

34,614. Would it be fair to expect an agricultural officer to make demonstration farms to pay as a general rule?—I think it ought to be confined to a very small number. It would be a feasible proposition to make one or two demonstration farms pay, but to be asked to make all demonstration farms pay is not altogether sound.

34,615. We have not heard very much good of Pusa in the United Provinces. Have you not got any good from the Mycologist in the past?—He has never attacked a problem that concerns us.

34,616. Any bacteriological problems?—I cannot say. There was that hopeful work of Mr. Hutchinson that interested me very much, but I was never able to make practical use of it.

34,617. What is your view about Pusa as a research institute with reference to the Provinces?—I think that what we should do at present is to develop provincial research.

34,618. Have you not found that some problems might benefit three or four Provinces? Let us take an example. Suppose you start an Imperial research station in rice which may be located in Madras or Bengal?—I do not think that that work is going to benefit the United Provinces for many years; probably it never will. Urgent problems such as rice improvement require tackling at once. We cannot afford to wait for some of the results which may perhaps never accrue. It should be attacked, I think, by the man on the spot.

34,619. Do you think that there is a place for Pusa if the right sort of problem is tackled?—Yes. I think it would be a mistake to do away with the present central organisation. We have got to deal with the basic problems there. But as regards crop improvement, I think those are the least basic of problems. Some of the work that has been done would have yielded better results if it had been tackled on the spot where it is of practical importance. And so I would suggest that as the line of development. In twenty years' time you would probably have plenty of room for more Imperial research work than you have at present, when, as I have said, you have realised what the basic problems are and what we have got to investigate.

34,620. Have you been a member of the All-India Board of Agriculture recently?—I was there at the last but one meeting.

34,621. You have had a good deal of experience. Do you think the Board has developed and is of any service?—I do not think it is of much practical value at present. I think that all the co-ordination that is done through the Board of Agriculture can be better done by allowing and encouraging visits to other Provinces where work similar to their own is going on. In the past such visits have not been discouraged by the United Provinces Government, but I have heard the views of people from other Provinces about it, and I have a strong impression that they were actually discouraged by not being given the necessary facilities for it. I think co-ordination for certain types of scientific work and, so far as is possible, in propaganda and demonstration can best be carried through by allowing persons to find out what is being done in other Provinces. Any one may wish to repeat in his fields the experiments that are being carried out elsewhere, and if you allow him to find out what is going on, that will bring about co-ordination better than any number of Board meetings.

34,622. You think that interchange of visits between people working on the same problem would be better than these sectional meetings?—I think so. I have thought over this rather considerably, and I would encourage a free interchange of visits. At the same time, I am not prepared to be emphatic on the matter in all its aspects.

34,623. In the case of crops, it is better to see a field experiment than to have a mere exchange of talk?—Yes.

34,624. For chemistry and entomology and such like subjects, would you consider that sectional meetings would be better?—Exactly. I think that there are certain subjects, perhaps entomology, for which sectional meetings would be better. From the point of view of Deputy Directors, I think it is better to encourage us to go to other Provinces.

34,625. Would you remove all restrictions on the free interchange of visits?—I would encourage it in every way possible; of course not beyond certain limits.

34,626. *Professor Gangulee*: Have you got any definite restrictions?—As I said, in the United Provinces there are not, but from conversations I have had with officers in other Provinces, I have got a strong impression that there are restrictions.

34,627. We are told that the research activities at Pusa are bound to decline. What are your views on the matter?—I think relatively they are bound to decline, if you are going to encourage the Provinces to solve their own problems. As I have suggested to Sir James MacKenna, until you find out what are the basic problems, there is little room for Pusa.

34,628. You have spent some of your time in Germany?—Yes.

34,629. Did you study their research organisations?—I was interested in smaller things in those days. Of course, I have always taken an interest in the organisation.

34,630. You do not know of any centralised institutes in Germany working in co-ordination with different research stations?—There are; most of the money in Saxony was Saxon money; that was for a section of agricultural work. I believe a lot of Imperial money is also spent there.

34,631. You have spent some considerable time in Iowa?—Yes.

34,632. Did you pay any visit to Washington?—I had been to Washington, but I went merely as a sight-seer.

34,633. Turning to your own selection and plant breeding work in cotton, what is the position actually with regard to Aligarh 19? It is, I understand, obtained by selection?—Yes.

34,634. Do you see any sign of deterioration?—No, I do not think so. There is no sign of deterioration. We have always kept a seed farm specially for keeping it pure, and I do not think there is any deterioration. It is a selection from the local types, and there is no real reason why it should deteriorate.

34,635. Is there any work going on on the hybridisation of cotton?—The results of Dr. Leake's work are being sifted and finally settled up.

34,636. You are still dependent on Pusa 12 and 4 for your wheat?—In the east of the Province they do distribute large quantities of Pusa 12 and 4, but in the west of the Province they do not. We are growing a type called Muzzafarnagar.

34,637. What is the reason for that?—We find that in the west of the Province it gives a better yield. On some of my farms, I grow half and half. The advantage from Pusa wheat is that it gives a good yield, and it allows me to distribute my labour; it ripens earlier.

34,638. When did you begin your research work on rice?—I think it was begun when the Botanist was appointed, about 1921 or 1922 when Mr. Sethi was appointed.

34,639. It is perhaps one of the chief crops in the Province?—It is a very important crop. It is a big area, but it is no more important than wheat. The area is roughly about the same; and the money value is not very much more than sugarcane, if you work it out in rupees.

34,640. What were your difficulties in the way of undertaking research on rice earlier?—There were no difficulties. When research on crops was started, it was with reference to the two obvious crops of great commercial importance. Up to about 1920, you may say that no work was done on any crops, except wheat, sugarcane and cotton, merely because there was no staff to do it.

34,641. Mr. Sethi is doing rice selection?—Yes.

34,642. Where was he trained?—I really could not say; I am afraid I do not know.

34,643. Could you tell us whether he is in touch with the rice breeding station in Coimbatore?—I could not tell you that. I was officiating Director only for a very few months, and I could not tell you, but those details could be very easily obtained.

34,644. Have you got a botanical survey of the varieties of rice that are grown in the United Provinces?—That was the first thing he did. I have seen the remnants of his collection, the ones that he has not discarded. He has a very large number of varieties still growing.

34,645. Has there been any attempt to introduce new crops?—We have tried all sorts of things.

34,646. Groundnuts?—We tried groundnuts. They succeeded very well in the Province for a few years, and then they went out, due, chiefly, to white ant attacks.

34,647. Have you tried tobacco?—We grow a large quantity of tobacco in certain tracts of the Province.

34,648. Perhaps in the Eastern Circle?—Yes; but we grow a certain amount in the Western Circle, in small areas round about towns and places where manure is available.

34,649. That is not an item on which you have carried on research?—The only thing that has been done on tobacco is that we have tried the Pusa selection.

34,650. You are trying the Pusa selection?—Yes, but we have not found it very successful. The west of the Province is hard for tobacco.

34,651. Did you attend the meeting of the Board of Agriculture held at Pusa on the 7th of December last?—No. Mr. Clarke went as the provincial representative.

34,652. I was interested to find there that Mr. Clarke favoured the proposal of establishing a tobacco bureau at Pusa?—Yes.

34,653. And he said that it would be welcomed by the United Provinces Government?—Yes.

34,654. Do you think such a bureau would help the Province in tobacco investigation?—Yes. Once we are in a position to take up investigation on tobacco, I should be grateful for all the information we could get from the bureau.

34,655. You say here that most of your time is devoted to demonstration work. The main item of demonstration, I take it, is seed distribution?—Yes; that is one of the main features of our demonstration work.

34,656. Do you have any arrangement for seed testing?—Yes, germination and that sort of thing. It is laid down as one of the routine duties of every person connected with seed distribution that before the seed is given out it must be tested.

34,657. You have a large number of private seed growers?—Yes.

34,658. Do they grow seed under certification?—Quite a lot of the seed passes through our hands, and quite a lot goes direct from them to the cultivators. What we wish to do is to make them independent, dealing direct with the cultivator who wishes to sow that seed. That is our ambition. It helps us very little if all the seed that they are growing has to pass through our hands. As Mr. Clarke has stated, production and distribution must be in the hands of one agency.

34,659. How much of your improved seeds go to the small cultivator, the man farming 5 to 6 acres?—I do not think I can give you reliable information.

34,660. My point is, are the improved varieties reaching him?—Certainly, because our system is to distribute on the basis of *sawai*, the details of which are given in Mr. Clarke's evidence. He is the fellow we are aiming to reach, and we reach him; there is no question about it. There is another thing which I have been doing as regards sugarcanes of improved varieties, for which there will be a very great demand this year. In the past, only a limited amount of seed was available; we found it inadvisable to touch the smaller man. We have now got more seed than the bigger people can deal with, and there is a demand from the smaller men. I have asked Collectors if they are prepared to advance *taccavi* for the purpose, and I think the Collectors whom I consulted will be quite willing to do so, provided the money is available.

34,661. The second item for demonstration is the introduction of improved implements. Is your recommendation for improved implements based on research and necessary experimentation?—The chief implements that we are trying to introduce are types of small ploughs.

34,662. Is it the Meston plough?—Yes, and ploughs of similar type produced now in India, and the demand is increasing.

34,663. Do you get any assistance from the actual manufacturers?—We do not get much assistance from them. We are encouraging local manufacture, but the manufacturer is doing extremely little at present to distribute them.

34,664. If there is a demand, one would imagine that commercial agencies would take it up?—The demand is very widespread, and there is a certain number of local agencies.

34,665. Commercial agencies?—Yes.

34,666. You are in touch with them?—Yes. We are doing everything we can to try and get them to do their best. For instance, the Board of Agriculture gave a grant to one of these agencies to build a godown to stock the implements. We are trying to give them every encouragement of that type.

34,667. On page 97 of your note, you have told us that artificial fertilisers are at present of little importance in the agriculture of the United Provinces. But on page 26 of the Report on Agriculture in the United Provinces, it is stated: "A very few years ago very little sulphate of ammonia was used. To-day thousands of tons are consumed annually;" How can you reconcile the two?—That point really was with reference to the whole of India. If you read further, you will see that I have gone on say: "India is looked upon as a most promising market, and upcountry possibilities are being fully explored".

34,668. You were not referring to the United Provinces there?—No. The fact is that about ten years ago 2,000 tons were consumed in India, and now the consumption is something like 30,000 tons. It does not refer to the United Provinces.

34,669. We are told in other Provinces that these commercial agencies dealing with farm implements or manures do not get adequate assistance from the Departments of Agriculture?—It is too early as yet to say that in the United Provinces, and I think at present it would be quite untrue, because my experience as Deputy Director has taught me to encourage those people who relieve us of some of our work, whether as manure, implement, or seed distributors.

34,670. Now I wish to put one or two questions about your experimental farms. I think you have one experimental farm in each circle?—Yes, roughly that is correct. There are two experimental farms in some circles. The idea is to have one experimental farm in each definite tract. A circle is not a definite tract. A circle may include one or two definite tracts.

34,671. Then you have demonstration farms?—Yes.

34,672. And these are the farms that you want to make pay?—Which we are making pay.

34,673. In 1921 there was a Government Resolution stating that they should be made commercially successful?—Yes.

34,674. But I understand that these farms were not paying before that date?—They were not. Before that, they were being used as subsidiary experimental stations.

34,675. From the Administration Report I find that out of these 15 demonstration farms there are only three which are at present working at a loss?—Is that for 1926?

34,676. No, 1924-25?—There is a later report than that. At present it is only one or two, I think.

34,677. Do you publish a profit and loss account of these farms?—I can tell you as regards my own. For instance, my largest farm, on which most money is spent, is about 120 acres actual cultivation and 140 acres in all. The expenditure is Rs.12,000, and the income Rs.24,000, or just about Rs.100 under Rs.24,000. My best farms work out at an actual profit of Rs.100 per acre.

34,678. Do you yourself keep the farm costings?—We do not keep an elaborate system of costings. We keep accounts, and a profit and loss statement is published in this report.

34,679. What struck me is this. Four farms which in the previous year worked at a loss of Rs.215 made a profit of Rs.1,369 the next year?—Yes. I do not see what is remarkable about that.

34,680. That farms running at a loss one year should show a large profit another year?—My own unfortunate experience in agriculture is that that is usual. After showing a profit they may be running at a loss again. For example, this year our profits will be lower, because the prices of sugar and cotton have gone down almost 50 per cent. in some cases.

34,681. Now, coming to your demonstration plots, are these demonstration plots situated in the cultivators' own land?—Are you referring to those given in the balance-sheets? These things that are described here as demonstration plots may be better described as very small demonstration farms.

34,682. Have you seed farms besides these demonstration farms and plots? —You will find in these balance-sheets some of the farms are referred to as seed farms, but they all come under the general category of demonstration farms which have to pay.

34,683. Are they separate from the demonstration farms?—Yes, in theory; not in practice. One is the Kalai seed farm. That is the one I have just referred to, the profits of which I have just quoted.

34,684. Then you have research farms?—Yes.

34,684A. Are they different from the experimental farms?—We tried to make a distinction to some extent between research and experiment. The research is the sort of primary investigation. The experiment is the thing that the officer carries out at his field trials.

34,685. Then you have got instructional farms?—There is only one such farm, attached to the educational institute. It is the college instructional farm.

34,686. In carrying out these field trials, do you follow a particular plot technique?—It varies; for instance, take Mr. Clarke's sugarcane trials. He is working out a technique in detail and working out the probable error, and that sort of thing, but in some cases we have not advanced as

far as that. We have gone more by judgment of yields and eye-judgment, and finally I must say you have got to accept the cultivators' word whether he thinks the thing you have given him is better than what he has got. That is the crucial test.

34,687. But in experimental work one has to be quite precise in following definite methods?—Yes. I think we are fairly precise in our experimental work.

34,688. Are you in touch with the work now being carried on by Mr. Henderson in Pusa? He has tried to develop plot technique?—I have read most of the papers that are being published on technique at Rothamsted. I have followed them fairly closely.

34,689. Not from Pusa?—I have not heard of any from Pusa recently.

34,690. Have you had trouble with mosaic disease in this Province?—It is just beginning to appear.

34,691. Have you no Mycologist here?—No.

34,692. Are you, therefore, in touch with Pusa?—They sent us an assistant last year, who went on tour for several days with me and took a lot of specimens away, the idea being to see if this really was mosaic or not. Some of the specimens he got were proved to have mosaic.

34,693. The Mycological Section at Pusa is taking up this work very seriously?—Yes.

34,694. *Mr. Calvert:* Coming back to the economic demonstration farm again, I notice the farm you mentioned just now as paying a very high profit, paid no rent?—It paid no rent; the land is owned by Government; there is also an item of depreciation which I think is given there but which is not deducted from the profits.

34,695. You mention getting a profit of Rs. 50 per acre from wheat?—Yes.

34,696. Is that after deducting all charges?—Yes, I think every charge was deducted. That was a trial carried on in the Central Circle. I think all charges were deducted.

34,697. Including rent?—Yes, I think so. I am not prepared to say definitely. I can get you those figures.

34,698. It would be interesting to have a statement showing how Rs. 50 profit from wheat was arrived at. Was that a specially selected plot?—No, an ordinary plot, where people were willing to take on this experiment. I do not think it was very extraordinary. The prices were not bad in that year. They were much better than they are now. Supposing you get 25 or 26 maunds per acre it would not be surprising. I grow 30 maunds per acre. The farm I have just been talking about grows 48 acres of wheat in a year and the average is 23 maunds. Some of it is not very good land either.

34,699. What was the Settlement Officer's estimate of the out-turn of wheat in that village?—The estimate for the whole Province was 11 maunds, I think.

34,700. The smallest of these demonstration farms is 25 acres, I think?—No, I think there are some smaller than that. One of my own which is called a demonstration farm is about 23 acres, with 20 acres cultivation.

34,701. In the Report on Agriculture in the United Provinces it is stated that the average tenant's holding in the west is about 6½ acres and in the east about three acres?—Yes.

34,702. Is anything being done to work out the most profitable method of utilising these small areas?—Not as units. We are not taking them up

as units. Our farms influence two classes of people; the big man with a similar area, and the small man, who is also interested because of the variety of crops we give him, but as a particular unit we have not started studying the small holding. When I was officiating as Director, I put up a scheme to take up this investigation by settling men who were typical tenants on typical holdings and running them as a co-operative body on about 200 acres. I do not know whether this scheme is going to be put through. My ideas on many of these things which are at present under discussion as possibilities for the future are very well described by the Registrar of Co-operative Societies in the letter sent with his evidence, in which he says: "The general conclusion that I wish to point to is that the Indian cultivator knows his own business much better than most people are willing to give him credit for; and the way to influence him is not by empty words, which go under the high-sounding names of publicity and propaganda, but by enabling him to see and to feel the practical advantages of any recommendations made." We shall never get further forward with many items now under discussion till we put them into practice on an experimental scale. My idea was to get a tract of 200 acres and settle on it about 40 tenants in an area where the average holding is about 4 to 5 acres and Government to give the supervision free and give them a programme to work to as regards cultivation, and help them to sell their stuff. It would be an interesting study in co-operative agriculture and also as a co-operative non-credit society.

34,703. These small holdings form, I understand, by far the vast majority?—We have not got detailed figures as you have got in the Punjab. We can only make deductions from our census reports, and settlement and area figures. They must be fairly numerous, we can safely say that.

34,704. Of that acreage, I understand, the greater portion is not irrigated by canal or well?—Quite a lot by well.

34,705. The majority is not?—Much is not irrigated.

34,706. On these small holdings, do you see any hope at all for the small holder?—I think the only hope is to cut down his expenditure by reducing all superfluous labour and then letting him work as a market gardener on co-operative lines. I think that is the line of development I should like to try.

34,707. Has your department done anything on a large scale for market gardening crops, say vegetables and fruit?—Yes, the garden staff is doing a lot at the various garden centres. For instance, considerable success has been achieved at Saharanpur.

34,708. You point out that for these small holders irrigation is very desirable?—Essential, I think.

34,709. That is to say, without intensive cultivation there is very little hope for the future?—None whatever.

34,710. You express some doubt as to why well construction has not developed to a still greater extent. Do you think fragmentation is one of the causes?—I think so.

34,711. Would not consolidation make the sinking of tube wells for these small cultivators an easier problem?—Yes, and all types of wells; I think that would be one of the greatest immediate advantages.

34,712. On the question of artificial fertilisers, is the cost of carriage a serious drawback to their use?—No. They are being put on the market at present at quite a reasonable rate. They are charging Rs.8-8-0 a maund for sulphate of ammonia, which works out at quite a reasonable rate for nitrogen.

34,713. What will happen when the demand increases?—I do not know whether the prices will go up. I think the rate is an artificial one at present; but I do not think the problem has arisen yet in this Province.

34,714. Granted you have got a very large number of small holders and that you can persuade them to go in for intensive cultivation with wells, will not some form of artificial manure or fertiliser be necessary?—Yes. We are having very good results in Saharunpur with these manures in spite of only six months' propaganda. An Irrigation Officer there took a great interest in it and helped our staff considerably, and the result is that trials on potatoes and things like that in that district have been an immediate success. It has there proved to be a practical proposition already.

34,715. Is there any hope for these people through encouraging artificial farmyard manure?—I do not think so. I do not see where we are going to get the basic material from. If you can provide that, I think your problem is solved. That is the basic problem, to provide organic material to feed the soil; some sort of farmyard manure, if you like. The whole of the success of green manuring is due to the organic matter that one ploughs into the soil. If we can provide the raw material, it is all right, but I do not see any possibility of the small man doing it.

34,716. Are you actually producing artificial farmyard manure in your farms?—No, I am not.

34,717. *Mr. Komat:* I daresay you are familiar with the economic position of the cultivators in this Province?—Yes, in the west of the Province.

34,718. In the Report on Agriculture in the United Provinces, it is stated that cultivation has paid well in recent years. I suppose you confirm that statement by your own observations?—The position of the cultivator is that he has been making greater profits in recent years than he was making ten years ago, undoubtedly.

34,719. That is only a comparative statement?—Yes.

34,720. I do not know whether you are responsible for Chapter XVI of this Report, which deals with the economic position of the cultivator? —No, I am not.

34,721. But you can tell me whether you can corroborate some of the statements and figures given in table K on page 115 with regard to net surpluses for the cultivators?—This was very fully discussed when the memorandum was drawn up, and the opinion I expressed was that the figures were slightly high.

34,722. From your experience you have reason to believe that these figures are very high?—No, slightly high, I said.

34,723. Taking Meerut Division, for instance, we are told that the nett surplus of a cultivator proprietor from an average holding would be Rs.353 per annum?—Yes.

34,724. You are inclined to think that that is rather high?—It is certainly high to-day, because since these figures were arrived at prices have fallen probably by not less than 50 per cent., and possibly in some cases considerably more. These figures must be taken for the year to which they refer; one must take into consideration the difference in prices.

34,725. But you are on the whole inclined to think that these figures are rather high?—Slightly high; that was the opinion I expressed.

34,726. *Mr. Pim:* You look forward to a great extension of well irrigation; in the area with which you are concerned, would that be much affected by the salts in the subsoil water?—No, with the exception of a small tract in the Agra district, I do not think we are suffering much from subsoil water, either from rising water level or the salts that follow from that.

34,727. It is only a limited area?—Yes; very, very limited I think.

34,728. The construction of the Sarda canal is possibly in some ways going to break new ground by introducing canal irrigation into a tract which is at the present moment fairly fully irrigated from wells?—Yes.

34,729. Is there any danger of deterioration of the standard of cultivation in those areas as the result of the construction of the canal?—I think the greatest danger is the rising water level which usually follows irrigation, particularly in a tract with a water level which already, in some districts, is extremely high; undoubtedly any substantial rise in water level will have a serious effect on sugarcane cultivation, particularly if it is followed by any accumulation of salts.

34,730. But with regard to the actual methods of cultivation, do you think there will be a temptation to be less careful?—The introduction of the Sarda canal will immediately afford opportunities for a much more thorough and intensive system of cultivation.

34,731. You consider that any changes of cultivation that would result would be for the better?—Yes, the immediate effect of the introduction of the Sarda canal will be to improve cultivation.

34,732. *The Chairman*: I think you heard what the Director of Agriculture told the Commission yesterday as to his views in connection with the possible future of Pusa as a centre of post-graduate teaching?—Yes.

34,733. Have you any opinion in that connection that you would like to express?—I think we must look to a central institute of the nature of Pusa for some of our future recruits to the Agricultural Department. A type of man can be chosen for higher training at Pusa. Men of our department, for instance, could be sent there for a course in agriculture.

34,734. What do you think would be the ideal scheme of education for an Indian Deputy Director in the future?—I would be inclined to suggest two types; I think it would be a mistake to close recruitment to outside sources, to people educated in Europe. I should also like to see an equal number of men whose training has begun in this Province; I think promising young men from our Subordinate Agricultural Service and the better type of provincial officers could be picked out and sent to Pusa. I think both lines of recruitment are advisable.

34,735. Would you suggest that a certain amount of study abroad would be a qualification for these higher posts?—Yes, if you are going to exclude men the whole of whose training has been abroad; but if you are going to allow that element to come in, I think training at Pusa after taking an agricultural or scientific degree would give us the men we require.

34,736. *Professor Gangulee*: Would you affiliate Pusa to any University? —Yes, I rather think I would; I think the sentimental value of a degree is worth something

34,737. Would you confine it to the M.Sc. degree, as was suggested by Mr. Clarke?—I should be inclined to confine it to something corresponding to the M.Sc. I think there is room for Pusa as a research institute in addition to being a teaching institute.

34,738. *Sir James Mackenna*: The suggestion of sending officers for training in England or Germany is limited to Deputy Directors?—Yes.

34,739. Would you recommend sending a Chemist or a Botanist to Cambridge?—Yes; we are sending some men Home for special training.

34,740. *Sir Thomas Middleton*: What is the minimum length of college or University training which you would regard as necessary for a man who is hoping later in life to be a Deputy Director? Would you say nothing less than a four-years' course?—Yes, I should say nothing less than a four-years' course.

34,741. Had you any training in agriculture before you went to Edinburgh?—No, but I came from a farming family.

34,742. After leaving Edinburgh you went to Leipzig?—Yes.

34,743. How long did you remain there?—Two years, roughly.

34,744. Then you were at Iowa?—Yes.

34,745. So that you had altogether six years?—Yes.

34,746. Do you think it is possible to get the general knowledge of agriculture that one desires in a Deputy Director in less than five or six years' training?—I do not know that I am prepared to answer that question offhand; it seems a long time.

34,747. I think four years is the normal college course in some of the Indian colleges, is it not?—Yes.

34,748. So that, your proposal of a post-graduate course at Pusa would make it five or six years?—It would be six years at least; I do not see how one can get out of it. If men are to be recruited from our Agricultural College, and I think it is very desirable, I think it must be that length of time.

34,749. Is it not the case that a wider training is probably required for the post of Deputy Director than for any other type of work in the Indian Agricultural Department?—It requires a very wide training; a Deputy Director has to tackle a great variety of subjects, very often in a non-technical way.

34,750. It also requires a considerable amount of experience?—Yes, the wider his experience the better. Of course, what happens usually in India, and it is very difficult to see how we can avoid it, is that young men are brought out and put straight into harness. I think it would be a great advantage if they could be trained, but at the same time that is very difficult. The only way they can be trained is by a senior officer on the spot; it seems to me that is all that can be done.

34,751. In the event of a young Indian graduate coming from such an institution as you have suggested, Pusa, for example, how is he to get the experience?—He would be trained by a provincial department, we will say, as a junior Provincial Service officer, or in any case, as a Provincial Service officer, and he would be put under a senior Deputy Director to get his experience in the department in circle work. I think that is the scheme that has already been put forward by Mr. Clarke, and we are hoping to recruit two or three of that type this year.

(The witness withdrew.)

RAJA JAGANNATH BAKSH SINGH, Rahwan, Rae Bareli.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) No.

(ii) Yes, in many districts. As far as I know there is only one agricultural school at Bulandshahr, and it is evident that it cannot meet the requirements of these Provinces. I am of opinion that at least one similar school should be opened in every agricultural circle in the districts which may be most advanced in agriculture.

(iii) Not necessarily, but preference should be given to teachers drawn from agricultural classes.

(iv) Yes. The question for stimulating the demand does not arise in these Provinces because the demand is far in advance of the supply.

(v) Service.

(vi) Not necessarily.

(viii) I am in favour of: (*a*) Nature study; (*b*) school plots; (*c*) school farms.

(ix) Mostly Government service.

(x) By making more room in the Government service through the expansion of the Agricultural Department, and making agriculture as a profession more profitable than other callings.

(xi) I do not see any such movement.

(xii) By creating a belief in the success of the modern methods of agriculture and making facilities for learning them; both these objects would be achieved by means of successful demonstrations.

(xiii) The agricultural institutions in rural areas should be administered and financed by the District Boards and the Government.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Encouragement to landlords to open and carry on successful demonstration farms on the lines best suited to the conditions of the locality.

(*b*) By encouraging and assisting tenants to open and carry on successful demonstration fields on lines best suited to the conditions of the locality.

(*c*) After establishing demonstration farms and fields as stated in (*a*) and (*b*) and thereby creating a belief in the success of the new methods, encouragements, namely, cheap credit, concession rents, improved seed and the provision within easy reach of suitable implements and their parts would induce the cultivator to adopt expert advice.

(*d*) Regarding the success of the demonstration work I would mention my own agricultural farm, as also referred to in the answer to this sub-clause by the British Indian Association of Oudh, which has yielded a net profit of 75 per cent. in the year ending 30th June, 1926.

QUESTION 5.—FINANCE.—(*a*) At present the agriculturists are labouring under great difficulties for want of means to obtain financial help for agricultural operations on suitable terms. It is very desirable that short and long-term credit may be provided for them. More extensive introduction of co-operative credit would be useful.

(*b*) I am not much in favour of the Government system of *taccavi* simply because the cultivators are put to much harassment both at the time of obtaining and repayment of *taccavi*.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main causes of borrowing are:—

1. Unthriftiness of the cultivator.
2. Unstability and uncertainty in the return of agricultural produce.
3. Low percentage of profit, and
4. Seasonal calamities.

(ii) The sources of credit are the village moneylender, co-operative credit where the societies exist, and *taccavi* advances made by zamindars and Government.

(iii) The reasons preventing re-payment are the same as stated in the answers to the above clause (*a*) (i) sub-clauses 1, 3 and 4.

(*b*) Unless the cultivators themselves become sufficiently intelligent to guard themselves against indebtedness, no artificial measures are expected to succeed in saving them from ruinous debts. In this respect it is extremely desirable that better provision should be made for the education of cultivators in order to make them realise the dangers of indebtedness.

(*c*) Yes.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) The best means to prevent the fragmentation of agricultural holdings are the introduction of suitable village industries in order to divert the energies of a considerable section of

the population towards them and to prevent the rush on land of those who have no other source of livelihood.

(*b*) The obstacles in the way of consolidation are many and various, and the practical difficulties in their way make them unsurmountable.

QUESTION 10.—FERTILISERS.—(*a*) Yes, by preserving manure according to the latest system and popularising fertilisers suited to the different soils.

(*c*) By means of demonstrations.

(*f*) The use of cowdung as fuel could be discouraged if a desire for intensive cultivation were created in the cultivator and a supply of some other fuel as cheap as cowdung were made available as a substitute.

QUESTION 11.—CROPS.—(*a*) (i) The improvement of existing crops can only be effected by means of intensive cultivation and selected seed.

(ii) Introduction of some fodder crop is extremely desirable.

(iii) Selected seed should be distributed as widely as possible and preference should be given to approved cultivators.

QUESTION 14.—IMPLEMENTS.—(*a*) As regards the introduction of new agricultural machinery, I would first of all urge the importance of a suitable harvesting machine to separate the grain from the straw and to make the straw into a good chaff fit for the use of the cattle; the present method practised by the cultivator is most tedious and wasteful as far as the time of the cultivator and the strength of his cattle is concerned; the operation takes place during the hottest part of the year and it renders the cattle exhausted and footsore and they are quite unfit for ploughing which begins soon after the harvesting is completed; consequently the agriculturist has to suffer a considerable economic loss on this account.

(*b*) I think supply on the hire system would go a long way to hasten the adoption by the cultivator of improved implements, in the areas where the demonstrations have created a demand.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) In order to improve the breed of bullocks, it is desirable that the Veterinary Department should take upon itself to castrate the country bullocks in the areas where it may be possible, to supply Government bulls of good breed either to the co-operative societies, to landlords, or to some other institutions which may maintain them.

(*c*) The shortage of fodder is usually most marked during the months of January and February and the scarcity exists for about six weeks.

(*e*) With an increase in the interest taken in agriculture in general, and intensive cultivation in particular; by the methods suggested in these answers and particularly in the answer to Question 25 (*a*), the cultivator would begin to take a keener interest in branches like the one dealt with here, namely animal husbandry.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) As a rough estimate, I would say that an average cultivator is required to work on his holding for about 275 days during the year and for the rest of the period he is either busy constructing or repairing houses, huts and wells and attending to social and religious engagements.

(*b*) I should think that yarn spinning, rope-making, and basket-making would make good subsidiary industries to occupy the spare time of their families provided the outturn fetches a reasonable return.

(*c*) I see no obstacles in the way of expansion of such industries as bee-keeping, fruit-growing, sericulture, pisciculture, lac-culture, rope-making, basket-making, but there will be some religious and social obstacles in the way of poultry-rearing by the Hindus.

(*d*) Yes.

(*f*) Yes.

(*h*) It is difficult to suggest means to this end unless the people are educated in the principles of hygiene.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) By means of attractive terms.

QUESTION 20.—MARKETING.—(*a*) The market facilities are not at all satisfactory as far as the improvement of agriculture is concerned, because little or no value is attached to the quality or the purity of the grain. I am speaking of the markets in Rae Bareli district, including the city, but I do not think there is any marked difference in the markets of other districts of Oudh or Agra generally from those I am speaking of. This I consider to be one of the chief causes for the indifference of the cultivator towards the quality and purity of his produce.

(*d*) Such information will be very useful provided it is authoritative.

QUESTION 22.—CO-OPERATION.—(*a*) An organised effort to improve agriculture in general and methods of cultivation in particular will be the best encouragement for the growth of the co-operative movement, for I think the co-operative societies will be one of the chief factors in any such scheme; I have made my suggestions in this direction in answer to Question 25 (*a*).

QUESTION 23.—GENERAL EDUCATION.—(*a*) The general education that is given in our schools and villages has no bearing upon the agricultural efficiency of the people; rather, on the other hand, it detaches their interest from the agricultural industry.

(i) I would suggest that compulsory agricultural education should be given in primary schools in the rural areas.

(ii) There should also be provision for agricultural education in the middle and secondary schools but there it may be made optional.

(iii) As far as higher agricultural education is concerned, I would not mix it up with general education.

(*b*) (i) Good and compulsory agricultural education would bring this result in the rural areas.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) In order to induce men of capital and enterprise, it is of the utmost importance to prove that large farms worked by machinery are capable of yielding as much profit as, if not more, than the farms of medium size worked by bullock power under the existing systems of cultivation; I say large farms because I think men of capital and enterprise would not be very enthusiastic in investing money for a small amount of profit, even if the percentage of profit may be fairly high. I further suggest their working by means of machinery, for I think it will not be possible to obtain labour for a large farm worked by bullock power unless one pays very high rates, which would ultimately reduce his own profit to a considerable extent and cause great loss to, and much annoyance amongst, the neighbouring cultivators by the general rise in labour rates of that locality.

I would therefore make the following suggestions:—

(i) That at least one demonstration farm, equipped with up-to-date machinery, should be opened by the Government in these Provinces.

(ii) Necessary advice, assistance and encouragement may be given to men of capital and enterprise who may apply to open similar farms, in the shape of: (1) loans on easy interest and reasonable terms to persons who own land but do not possess enough cash; (2) land to those who possess cash but are not big landowners; (3) expert advice and men on deputation to guide the work unless the farmer is enabled to make his own arrangements; (4) supply of good seed; and (5) assistance in the disposal of farm produce on the best available terms to be had in the country.

(*b*) Lack of enterprise and uncertainty of receiving good returns are the chief amongst the factors that discourage landowners from carrying out improvements.

Raja Jagannath Baksh Singh.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) A large majority of the rural population being agriculturists, it needs no argument to support the contention that the prosperity and well-being of the rural population depends chiefly on the improvement of agriculture; and in order to obtain a general improvement in agriculture it is of paramount importance to effect a change in the present indifference of the cultivator into a desire for intensive cultivation, and his conservative persistence in old and wasteful methods into an appreciation of new and improved methods of cultivation. I am of opinion that satisfactory success can be achieved in this direction by means of demonstration, propaganda, encouragement and assistance:—

(i) Regarding demonstration work, I would like to suggest the following scheme:—(1) that the Government should open one model demonstration farm in every district, and this farm should be worked according to modern methods of cultivation that could be practised by an average cultivator; (2) landlords and tenants may be encouraged and assisted to open village demonstration farms on the lines of the model demonstration farm stated above; (3) cultivators possessing small holdings may be induced to open smaller demonstration farms on similar lines called demonstration fields; and (4) still poorer cultivators who choose to avail themselves of the concessions suggested here may be allowed to open still smaller farms called demonstration plots.

(ii) The following will be some of the means of propagating the above scheme:—(1) in every district where model demonstration farms may exist agricultural exhibitions should be held according to the needs and convenience of the population, and special opportunities may be afforded to the cultivators to compete in them; (2) representative district committees may be constituted to manage exhibitions and co-operate with the Government in the propagation of the above scheme; and (3) in order to derive the benefits of co-operation and in view of further propagation of the above scheme amongst the village people, village societies may be formed in the villages by the aid of the district committees and the co-operative societies may be incorporated with them, if possible.

(iii) The following are some of the encouragements that would go a long way to induce the cultivator to open any of the above demonstration farms that suits his convenience and resources:—(1) advance of loans on cheaper rate of interest and convenient instalments; (2) supply of selected seed at a cheaper rate of interest and at a place as near their holdings as possible; and (3) supply of implements and parts at attractive rates on hire as well as on sale.

(iv) The following assistance would be indispensable to a farmer:—(1) good communications from holdings to the market place; (2) satisfactory market facilities in order to enable the cultivator to obtain the best price for his produce; and (3) establishment of village industries to utilise the spare time of the cultivator.

I am aware that the above is but a rough outline of a scheme and that a number of suggestions embodied in it have been dealt with in answers to the various questions of this Questionnaire, but still I think that the suggestions put together, in not even a very methodical way, may be of some use to the Royal Commission while considering this most important subject of the well-being and prosperity of rural population.

(*b*) Yes.

Oral Evidence.

34,752. *The Chairman:* Raja Jagannath Baksh Singh, we have your note of the evidence which you wish to give before the Commission. Is there anything that you would like to say at this stage or may we ask you some questions?—I have nothing in particular to say.

34,753. Are you a landholder?—Yes.

34,754. Could you give us the extent of your estates?—My estate consists of twenty villages.

34,755. Do you farm yourself?—Yes.

34,756. On your home farm?—Yes.

34,757. On irrigated or unirrigated land?—Irrigated land.

34,758. What are your principal crops?—Wheat.

34,759. Do you carry out anything in the nature of experiments?—No.

34,760. You have not any experimental farm?—No, I have not got anything like that, only demonstration farms.

34,761. It is a system under which an arrangement is made between the Agricultural Department and yourself?—There is no particular arrangement. I am carrying on my demonstration farms on the lines practised by the cultivator.

34,762. Are you multiplying and distributing seed of improved varieties?—I sell my produce to the department and they distribute it. I do distribute seed myself but that is not improved seed, and it is not done on any general scale. If any particular tenants want improved seed I give it to them, but most of my produce is sold to the department.

34,763. Are you growing any sugarcane at all?—I used to grow some, but I did not find it profitable.

34,764. How do you account for the fact that it was not profitable?—I found two defects with regard to that: one was that my place was not a sugar producing tract, and the other was that the process of making *gur* was very tedious and wasteful. I could not sell my crop to any factory and I found that it was not successful. Wheat was more successful than sugarcane.

34,765. Do you apply manure or fertilisers to your wheat land?—Yes, I do.

34,766. What do you apply?—Nitrate of soda, to selected plots and selected fields; and cow-dung in all. I have got a block where I apply manure and another which is unmanured. In the manured block I mostly put cow-dung manure, but in selected fields, I give nitrate of soda.

34,767. You have one block which is never manured?—Yes.

34,768. Could you tell the Commission how the profits on these two blocks compare?—I have not calculated the profits but I can tell you the yield. My average yield on the unmanured block is about 10 maunds per *pucça bigha** which comes to about 16 maunds per acre, while on the manured block the yield is 16 maunds per *pucca bigha* which comes to about 24 maunds per acre.

34,769. And that difference is enough to cover the cost of the fertiliser and leave you a margin of profit?—I have not calculated as to whether it is enough, but I think it would be.

34,770. Do you notice any progressive deterioration in the unmanured land?—I have not found that to be the case. I find the average is increasing.

34,771. Is there any plant food in the water that you use for irrigation? Is there a certain amount of silt?—No, the unmanured block is clayey soil while the manured block is sandy soil.

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* A "pucca bigha" is, roughly, $\frac{5}{8}$th acre.

34,772. But it is in the unmanured block that you see a great deal of improvement?—I find improvement in both. I have made no comparison.

34,773. I was wondering whether the water that you put on to your land accounts for this improvement?—No.

34,774. Presumably then it is due to the good tillage?—Yes. I irrigate the unmanured block from a big tank.

34,775. So that it is not likely that there is much silt in that water. That would be deposited in the bottom of the tank?—Yes.

34,776. I would like to ask you about cattle. How many pairs of working bullocks do you yourself keep?—I have got twenty pairs.

34,777. Do you find the fodder problem acute in certain seasons?—Very acute.

34,778. Are you making any experiments to meet that difficulty?—I wanted to know if Government has got any successful crop to introduce.

34,779. Have you been to their stations to have a look at what they are doing?—Not with a view to find out a successful fodder crop.

34,780. Do you keep any milch cows at all?—Yes, for domestic purposes only, but not on dairy lines.

34,781. Have you tried the silo at all for preserving fodder?—Yes.

34,782. What is your experience?—It is quite good. When the cattle are accustomed to eating it, it gives good results. It takes time for them to get accustomed to it and at first they do not eat it readily.

34,783. It rather depends on how it is made?—Yes, if it is not in good condition the cattle will not eat it.

34,784. And also if it is really well made they take to it readily, whereas if it is sour they take a long time?—Yes.

34,785. Now to turn to the substance of your note: Are you familiar with the school at Bulandshahr?—Not very familiar with it as it is at one end of the Province and I have not visited it.

34,786. You form the view, I understand, that there is a growing demand for agricultural education?—Yes.

34,787. Do you think that the cultivators in your villages are beginning to demand better education in the most general sense for their children?—Yes.

34,788. Do you notice a difference in the last five or ten years?—Yes.

34,789. Do you think opinion is on the move?—It is; there is a rush for admission into the schools.

34,790. Bearing in mind that the Agricultural Department has only been some twenty years in existence and that a long war has intervened, I should like to ask whether you are, on the whole, satisfied with the progress that has been made?—No.

34,791. You think more might have been done?—Yes.

34,792. With the money that has been spent, or do you think that more money should be spent?—More money should be spent.

34,793. May I ask you to turn to page 132? In answer to Question (3) (*d*), you refer the Commission to an answer by the British Indian Association of Oudh?—Strictly speaking, I do not represent the British Indian Association. I am here as a farmer.

Raja Rampal Singh: The answers of the Association are with me, and I shall send them in.*

* Not printed.

34,794. *The Chairman*: In answer to our Question 5 (*b*) on the same page 132, you say: "I am not much in favour of the Government system of *taccavi* simply because the cultivators are put to much harassment both at the time of obtaining and repayment of *taccavi*." Take the point in its component parts, firstly at the time when the application was made. Do you think that the inquiries made were unreasonably detailed?—That is also a factor which creates delay in payment.

34,795. But do you suggest that these inquiries are too complicated, that they should not be carried on as they are carried on at the moment?—They should be more speedy.

34,796. How about the harassment at the time of repayment?—My experience is that the persons who go to collect the money try to collect it at a period when the tenant is not in a position to pay, and naturally he would like to defer payment at that time.

34,797. Do you mean that the loans are collected at a particular season which is inconvenient?—In some cases it is so. I am simply pointing out this as one of the ways of harassment.

34,798. Do you not think that one of the real difficulties is, that in lending public money and in collecting repayments of public money, a certain strictness is inevitable and that that is necessarily unattractive to the cultivator?—I had considered that point, but I think when the Government is lending money, it is acting like a creditor and the principles of a creditor can only be successful as far as the Government is working as a credit department.

34,799. You mean Government is in competition with the moneylender and that the cultivator prefers the way of the moneylender?—Naturally.

34,800. Although those ways may mean an appearance of kindness at the time, but anything but kindness in the long run?—Exactly.

34,801. You give, on the same page, in answer to Question 6, as the sources of credit the village moneylender, co-operative credit where the societies exist, and *taccavi* advances made by zamindars and Government. Is the practice of lending cash to tenants widespread amongst landlords in this Province?—I think it is fairly widespread.

34,802. What is the usual rate of interest charged?—From 12 to 18 per cent.

34,803. Have you any co-operative societies on your estate?—There are in some of the villages.

34,804. What is your view of the state of these societies?—They are not very popular.

34,805. Do you know at what rate of interest they are lending?—I do not.

34,806. With regard to fragmentation of holdings, in answer to our Question No. 7 (*a*) the best means, you say, to prevent the fragmentation of agricultural holdings are the introduction of suitable village industries in order to divert the energies of a considerable section of the population towards them. Have you there contemplated these village industries being taken up as a whole-time occupation by a proportion of the population?—Yes.

34,807. So that your idea is that, on the death of an owner, some of his sons might be engaged in these occupations and would therefore not be anxious to take up any land?—Yes.

34,808. Are you yourself making any experiments in the way of improved implements?—No, I am not making any experiments in that direction.

34,809. Are you using any power cultivation?—No. I used pumping plants, oil engines.

34,810. To lift from wells?—Yes, and also from tanks.

34,811. Have you yourself sunk many wells?—Yes.

34,812. How many approximately?—I have not calculated the number, but it would be about twenty.

34,813. Have you had a high percentage of successes?—Yes, fairly high.

34,814. Have you had any failures with your bores?—Yes, some failures.

34,815. Do you find that the supply of water from these wells is more or less even over your estate, or does one well vary a good deal from another in that respect?—It depends upon the tract of land. In clay it is generally high, but in sandy soil it is low.

34,816. Do you know the output of your best well in gallonage?—For my best well I used a suction pipe of 4 inches and a delivery of 3 inches. The capacity of the pump was 14,000 gallons per hour.

34,817. Could you keep up that supply of 14,000 gallons per hour, or did the well give way or dry up?—To a certain extent it gave way, but there was a point where the supply was steady.

34,818. How many acres were you able to work with that supply?—About 70 *bighas*; that is the area of the block in which the well is situated.

34,819. Are you breeding any of your working cattle yourself?—Yes, I have a small cattle farm.

34,820. What bulls are you using?—I have lately indented for a Hissar bull. I had one Ponwar bull first and then I had a Kherigarhi.

34,821. From the Government farm?—Yes.

34,822. Have you had success with it?—The Ponwar was better; the Kherigarhi has not been successful.

34,823. What quality of cows did you use?—Indigenous.

34,824. Of what breed?—It is an indigenous mixed breed.

34,825. On page 133, with regard to agricultural industries, you express the view that the average cultivator works for about 275 days in the year, and out of the remaining 90 days he is either busy constructing or repairing houses, huts and wells or attending to social and religious engagements. Do I understand that it is your view that he may usefully employ some of that time in augmenting his income by some spare-time occupation?—Yes.

34,826. Have you any suggestions as to how such spare-time occupations might be encouraged amongst the cultivators?—There are a number of spare-time industries suggested in the Questionnaire, and I think they are good.

34,827. I take it that some steps would have to be taken to encourage cultivators to go in for those?—Yes.

34,828. You touch a very important point on page 134, in answer to our Question 20 on marketing, and you point out that one great flaw in the market facilities in the districts that you are familiar with is that no value is attached to the quality or the purity of the grain. Have you any suggestions for improving that position?—I think at present the department should arrange to purchase good wheat.

34,829. You do not think there is any hope of bringing about any change in the market which would assure to growers of improved varieties, who marketed those varieties pure, a reasonable price for the quality?—Not to begin with.

34,830. Where do you market your own wheat?—I have said just now that I sell it to the department.

34,831. Do you contemplate giving children of the primary schools any vocational education?—I contemplate elementary agricultural education in the primary schools.

34,832. You do not think that literacy is the great desideratum in an elementary system?—It is.

34,833. Do you not think that there is the danger that, if you superimpose this vocational course, you may prejudice the cause of literacy? Is there enough time to teach these small children to read, to write and to do arithmetic, as well as to teach them some of the elements of agriculture?—Most of the students being sons of agriculturists, it will not take much time to divert their interest towards agriculture.

34,834. Do you go in for any detailed system of accounting on your farm? —I have got some accounts here with me.

34,835. I was wondering whether you could give us the figures of your gross and net profits on the wheat land for any series of years. If we could get information from you, it would be valuable, because it would give us an opportunity of comparing the profits of a large scale farm with those of a small farm?—I have not got figures for several years, but for this year I have got some figures.

34,836. Could you trust us with those?—I should be very glad to supply the figures if I get the form in which you want them.*

34,837. *Sir James MacKenna*: On page 133, you recommend the introduction of agricultural machinery, citing the particular case of a suitable harvesting machine. Do you recommend the introduction of machinery because labour is becoming scarce in the neighbourhood?—No, but because it is very exhausting to the bullocks.

34,838. In this particular case you quote the reason, which is new to me and it is important. What will happen to the labour that is displaced by the introduction of machines of the kind you mention? What will they do? It will take less men to run this machine than under the old methods of threshing?—These machines will not create any excess of labour.

34,839. You think they will find other jobs to do?—Yes, because no labour is required in threshing *bhusa;* it is the bullocks which do it.

34,840. Would you recommend the introduction of machinery in places where there is an adequate supply of cheap labour?—Provided it is not more costly. I would recommend machinery, if it is profitable to use it.

34,841. You have got a supply of cheap labour?—Labour is not scarce in Rae Bareilly.

34,842. Have you tried Pusa wheats on your estates?—Yes.

34,843. How do you find them? Are they good?—Yes.

34,844. Are they good in comparison with the local varieties?—Yes.

34,845. What would be the percentage of increased out-turn?—I do not possess the figures.

34,846. Would you say that they are 30 per cent. better in out-turn?— I have never tried them on a field side by side with other varieties.

34,847. You have not compared them. You think they are distinctly better?—I think they are distinctly better.

34,848. When did you start your home farm?—I have been doing farming for the last twenty years or so, but the system of accounts that I now have and the methods that I follow at the present time have been in practice for the last ten years.

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* Not received.

34,849. There was a great revival of interest in agriculture amongst the talukdars about ten or fifteen years ago?—Yes.

34,850. Instead of letting out all the land for cultivation, they started their own home farming?—Yes.

34,851. You were actually interested in agriculture before that general movement took place?—Yes.

34,852. *Professor Gangulee*: What is the method of paying labourers' wages?—In cash and also in kind.

34,853. How much cash?—It varies from 1½ annas to 4 annas. They are paid in kind only for the harvesting operation, at the rate of a seventeenth part of the grain which one collects.

34,854. I understand you get most of your labourers from your twenty villages?—Yes, almost all.

34,855. These villagers do not possess land of their own?—Some of them have land, but a few of them have not enough land for their cultivation.

34,856. Are you connected in any way with the District Boards?—I was.

34,857. Could you tell us what is their view with regard to agricultural education or education in rural areas?—I do not know what their views are, but practically I see no sign of their activity on the rural side.

34,858. What are their chief activities?—Primary education.

34,859. Do they assist the Department of Agriculture in any way in their demonstration work?—I do not think the Rae Bareilly District Board in any way help the Department of Agriculture.

34,860. Their chief activity is primary education?—Yes, primary education and communications.

34,861. What is your view on the question of fragmentation of holdings? Is it a serious handicap to agricultural improvement?—I think it is.

34,862. Have you given any thought to the matter, as to how you would bring about consolidation?—Do you mean consolidation or preventing fragmentation?

34,863. How could fragmentation be stopped?—I have suggested that some suitable industries should be encouraged. I also think that it would be better to have some legal measures taken. For instance, the law of inheritance amongst the cultivators may be amended.

34,864. What are the views of the landlords of this Province in regard to the problem of fragmentation of holdings? Do you think they would be in favour of legislative measures to check the evil?—My reply to that is not given as representing the view of the landlords, but I personally think that fragmentation should be avoided as far as possible.

34,865. You think it could be done only by legislative measures?—Yes, and by introducing other suitable industries or other callings.

34,866. You talk about improved implements. What are the implements you are thinking of?—Ploughs.

34,867. Better ploughs?—Yes.

34,868. Iron ploughs?—Yes.

34,869. You are introducing iron ploughs?—I am using iron ploughs.

34,870. You have no difficulty in getting suitable draught cattle?—No; there is no difficulty at all with the Meston plough.

34,871. Have you taken any interest in the co-operative movement?—Not much; I never thought it was very successful or well organised, unless the organisation came from the top.

34,872. There are no societies in these twenty villages under you?—There may be a few; I was told they were formed, then liquidated and then formed again; that is what I heard. There were no stable societies with any reputation behind them.

34,873. You yourself have not taken an interest in this movement?—I am not an expert in co-operation and I have not taken much interest in it.

34,874. Would you engage the services of a graduate of the Agricultural College to look after your farm?—Provided he is interested in agriculture.

34,875. Naturally a graduate from the Agricultural College would be interested in agriculture?—I doubt very much whether in the majority of cases they are.

34,876. *Sir Ganga Ram*: Have you tried one?—No, I have not yet tried one. My experience of those I have met is that they prefer Government service to agriculture.

34,877. *Professor Gangulee*: Has it been your experience that the graduates turned out by the Agricultural Colleges are not interested in agriculture?—That is not my personal experience; that is my general knowledge.

34,878. Have you at any time paid a visit to Cawnpore Agricultural College?—I did, a short time ago.

34,879. Where did you meet the graduates of these Agricultural Colleges?—In Lucknow. I am not particularly referring to graduates of the Agricultural College, but to students who have passed through the agricultural courses.

34,880. You formed the view that they are not sufficiently interested in agriculture?—I think most educated persons are not interested in agriculture as a profession.

34,881. *Mr. Calvert*: Would you feel inclined to venture an opinion as to whether rural debt is increasing?—It is difficult to say that off hand.

34,882. Is there any other outlet for the capital of the moneylender apart from moneylending?—Yes, he can go in for agriculture himself.

34,883. Could he get the land?—Yes, he could purchase it.

34,884. But, apart from that, is there any other outlet?—He could invest it in other industries.

34,885. Why do not they invest in other industries?—As long as they can invest their money in business near their homes and get sufficient profit, they do not like to go in for other industries.

34,886. That is to say, they like to invest their money near their own homes?—And at a good profit.

34,887. *Professor Gangulee*: At a high rate of interest?—Yes.

34,888. *Mr. Kamat*: In this Province what are the relations generally between the zamindars and the tenants? Are they improving of late?—They are improving.

34,889. Do you think recent legislation has helped to bring about this improvement?—Yes.

34,890. *Professor Gangulee*: To what legislation are you referring?—The Agra Tenancy Bill and the Oudh Rent Act.

34,891. *Mr. Kamat*: As a rule do the zamindars take any serious interest in agricultural improvements and reforms?—Yes, they are beginning to do so; there is considerable improvement.

34,892. You mean they are taking greater interest of recent years?—Yes.

34,893. Or is it only since the appointment of this Commission?—No.

34,894. The improvement is of longer standing?—Yes, I think so; I do not think the appointment of the Commission has affected it at all.

34,895. Do you agree that the zamindars are in a position to carry out a good many agricultural reforms if they have the will to do so?—If they have the will and advice.

34,896. That is exactly what I wanted to ask you about. What are the difficulties in the way of improvement? Are you in touch with the Agricultural Department, or are there other difficulties?—But the Agricultural Department itself is not in a position to give us any particular advice.

34,897. You find the Agricultural Department is not in a position to give you advice?—No, they are doing the same as the cultivator is doing.

34,898. You really mean that the various demonstration farms that the department has started, and the seed stores of which we read in this memorandum, have not helped the zamindar class?—No. The demonstration farms and the seed stores are two different things. The demonstrations have not yet created a belief in their success in the population, while the seed stores were only established a year or two ago.

34,899. Do you consider that on the whole the activities of the Agricultural Department have not affected the zamindar class?—They have not affected it considerably. In what way do you mean it has been affected?

34,900. In creating a greater interest on their part in the matter of agricultural reform?—They have.

34,901. We have been told that as a result of the system of making demonstration farms a commercial success, no less than 500 private farms have been opened, and, similarly, capital may be attracted owing to the system that the department has introduced. Do you not regard that as an indication that the department is useful?—It is very useful; I do not say it is not useful; but I think much more could be done.

34,902. Apart from the advice which you seek from the department, are there any intelligent zamindars who of their own initiative could introduce reforms, for instance, in regard to cattle breeding and the use of machinery?—They can, of course, with regard to cattle breeding, but there is hardly anyone who can introduce machinery unless they get good reliable expert advice. There are some zamindars who would like to go in for machinery, but they are hesitating because they are afraid it might fail and cost them a lot of money.

34,903. So that there again you feel that you lack technical advice?—Yes.

34,904. And if that technical advice were available, zamindars would go in for new implements and machinery, and might perhaps even hire them out for the benefit of their tenants?—I think so.

34,905. You think that is quite possible?—Quite.

34,906. What is hindering the zamindars from approaching the department concerned for technical advice? Is it their apathy or the apathy of the department in giving that advice?—To a certain extent both.

34,907. I want to know whether the zamindars have evinced a desire to approach the Agricultural Department, or are they rather indifferent about it?—From the zamindars' point of view, I have not yet ascertained how many of them have approached the Agricultural Department; and from the Government side, I have not yet seen what particular advice is being advertised or popularised.

34,908. You said that judging from your general knowledge, you have not very much faith in the agricultural graduate?—No, I did not mean to say I have not much faith; I mean to say that no particular interest

in agriculture as a profession is created in them by the training they receive. I do not say that I have no faith in the graduates of the agricultural colleges.

34,909. If you have faith in the agricultural graduates, why is it that the zamindar class is not utilising the services of men trained in the agricultural colleges?—Because they think trained men will cost more and will not show any proportionate results.

34,910. They are afraid of the market value of the trained man; is that one of the difficulties? Is the difficulty that they are afraid they will not be able to afford the high salary of these trained men?—One point is that they will have to pay more and that the men will not be able to produce any proportionate results. I think I am quite clear in my reply.

34,911. That virtually means that you have no confidence in their knowledge?—Not that, but I do not know what they will do.

34,912. *Professor Gangulee:* Perhaps the difficulty is that you have no faith in their efficiency?—Judging from our experience of the demonstration farms carried on by Government, I do not see what these graduates can do in particular. I have always been told up to now that these Government farms have not been successful generally, though a few of them have been obtaining good results and a few were making good profits. If the Government demonstration farms are not any very great success, I do not know what better results the graduate will bring on private farms.

34,913. In the first place you say that the demonstration farms are not a success, and, in the second place, men trained on the Government farms would not be of very great value to you?—Economically, yes. They might do well on large farms, but there are no large farms.

34,914. Bigger zamindars can cultivate large farms?—Yes, they can have large farms, but how will they manage them?

34,915. Surely there must be any number of big zamindars who could take up all the graduates turned out by the agricultural college?—Yes, if their farms are worked by machinery.

34,916. I mean there is no shortage of big zamindars as compared with the number of students coming out of the colleges. Is it a mutual lack of confidence which is at the root of the difficulty?—I do not think there is any lack of confidence generally prevailing among the zamindars with regard to these graduates.

34,917. With reference to spare-time occupations, can you make any definite suggestions, beyond those you have made in your memorandum, as to small agricultural industries? I am not talking of rope-making or basket-making, but of somewhat larger industries. Could the zamindars take up such industries in this Province?—I have not thought out any particular ones that could be taken up.

34,918. Perhaps I might suggest one by way of illustration. In this Report on Agriculture in the United Provinces we are told that pressing oilseeds is a feasible proposition if done on the proper scale?—Yes.

34,919. I daresay there are zamindars in the United Provinces who might start an oil-pressing industry if they had the expert knowledge, had better helpers and provided they had the will?—Yes.

34,920. Have the bigger zamindars got the will?—I have no information that they have thought about it. Some of them may have.

34,921. Have they never thought of it so far?—Some have, but generally speaking I have not much information as to whether the bigger zamindars have thought about these questions.

34,922. I am just indicating one more line in which the technical knowledge which the department is prepared to place before the public may be utilised by the zamindars. Yesterday we were told by the Director of Agriculture that a small plant for sugar manufacture might be a paying proposition. Have the zamindars, for instance, ever thought about this problem, and approached the department for something to be done in that direction?—I do not know what the particular suggestion of the Director was, but I think that attempts at manufacturing sugarcane have not yet been very successful in these Provinces.

34,923. Are you speaking after full inquiries from the department or are you simply giving expression to your general impressions?—I have made no inquiries from the department. It is only my general impression.

34,924. Do you think it would be worth while for the bigger zamindars to make definite inquiries and find out whether in these Provinces sugar manufacture would be a feasible proposition?—Yes.

34,925. It has not been done by the zamindars?—No. No particular method has been inquired into, but the factories which have been working here have not been a great success.

34,926. There again you say you are speaking from general impressions. Have you studied the question and found by inquiry that sugar manufacture is out of the question in the United Provinces?—No, I have not studied that.

34,927. What I am suggesting is this. Is it possible for the zamindars to utilise the services of agricultural graduates, for instance, to start some industries like oil-pressing or sugar manufacture? Perhaps sufficient inquiries are not being made by the zamindars, and sufficient advantage is not being taken of the knowledge of the department. There are possibilities and prospects along these lines if the zamindars care to avail themselves of them. Do you agree?—Yes, I do agree. I have already placed before the Commission my statement that interest in agriculture should be created by Government. I do admit that there is a lack of interest in agriculture at the present time.

34,928. On the part of zamindars?—Yes, and also on the part of tenants.

34,929. *Mr. Pim:* What is the size of your farm?—It is 300 *pucca bighas*, under plough.

34,930. Have you considered using the section of the new Act for increasing its size, or are you satisfied?—I have not had to use the sections of the new Act because the farm existed before the Act was amended.

34,931. Are you satisfied with the size of your farm or are you trying to expand it?—I may have to expand it.

34,932. Is it compact?—It is in two blocks. One is situated to the north of my house about two miles away, and the other to the south, about the same distance. Only one of these blocks has a tank, and the other is irrigated by a well.

34,933. Are they both fairly well irrigated?—Yes.

34,934. How much of the area is *do fasli*?—What do you mean by *do fasli*?

34,935. I mean two crops, two crops in the same year; for instance, rice and gram?—That would be about 50 *bighas*.

34,936. Nothing very much?—No, very little. The wheat block is rotation; only the rice crop is *do fasli*.

34,937. You are anxious to extend intensive cultivation, but you said you do not grow cane? —That is so.

34,938. In certain parts of your district a good deal of cane is grown?—Yes, I know it is grown in some of my villages.

34,939. Are there defects in the soil of the villages in which your farms are?—Yes, I think the soil is not very suitable. In the block in which I tried the soil was not very suitable. I did not like to try the chief wheat block after one failure. There was another difficulty, that of *gur* making.

34,940. Was that the chief difficulty?—Yes.

34,941. In the Partabgarh and Sultanpur districts there is a strong prejudice among some of the *Thakurs* against growing cane at all. Is that felt at all in Rae Barelli?—No.

34,942. You have never heard of it?—I do not know of it.

34,943. The last two settlement reports of these districts laid stress on the point?—I do not think there is any prejudice against it in Rae Barelli.

34,944. You have not found it paying?—No.

34,945. Is the Agricultural Department represented in your district?—It has a small farm.

34,946. Have they a local representative?—Yes, one Babu Hari Har Singh.

34,947. Did you get their advice when you were trying to grow your cane?—I said I gave it up some years ago.

34,948. You did not do it with the help of the department at all?—Yes, I did take their advice, and I took seed from them of different varieties.

34,949. Did you try several varieties and were they always failures?—They were not very successful economically. They did not compete with wheat.

34,950. Who manages the farm?—I have a Superintendent.

34,951. Is he an old family servant?—Yes.

34,952. Did you ask the department whether they could give an explanation of the comparative failure?—No.

34,953. I mean as regards the actual out-turn of cane?—I did not ask them.

34,954. As regards labour you want to prevent too much competition for land, and you suggest alternative occupations. Are there many people in the villages in your neighbourhood who go and work outside the Provinces in Calcutta or in the mines?—Those who go out and work in Calcutta, Madras, or Bombay and so on are not of the labourer class. The labourer class mostly go to Cawnpore.

34,955. Many do go to Cawnpore?—Yes, and to Benares.

34,956. You mean to say that they have not gone to such an extent as to cause a real scarcity of labour?—No, there is no scarcity of labour.

34,957. As regards education, what is the position now as regards the lower castes getting into schools in your neighbourhood? Is there any difficulty?—There is no particular difficulty for the lower class boys being admitted into schools.

34,958. I do not mean in theory, but in practice?—No, not even in practice. I have seen some Pasi boys in primary schools.

34,959. So these difficulties have gone?—Yes, they have gone.

34,960. *The Chairman:* Is there a 30 years' settlement in your district?—Yes.

34,961. When is the settlement due?—Now.

34,962. *Sir Ganga Ram:* What is the rate of labour in your district?—It varies from 1¼ anna to four annas. It is four annas for a good adult

labourer for lifting water; for weeding crops, boys and old women get 1½ to two annas.

34,963. Do you think there is increased poverty in these Provinces as compared with other Provinces? In the Punjab the rate is 12 annas. Can you say why it is so? Are the people in these Provinces less industrious?—I think they are less industrious.

34,964. In Sind they are going to colonise a large number of people and give them lands. Do you think your people will go there? Have they got an ambition to better their condition of life?—Why not? I think they will go there.

34,965. Are you quite positive?—Yes. I see they are going to Mauritius and Java.

34,966. Is there any migration to Java from these Provinces?—I think a number of people have gone there.

34,967. Are they from the artisan class or from the coolie class?—Mostly from the coolie class. A number of people have returned.

34,968. *Sir Henry Lawrence*: Do you think that emigration is open now and people can go there?—I do not know whether it is prohibited at the present time or not, but I know people who have returned from there and people who are still there in different places.

34,969. How many years ago did they go there?—I have no statistics.

34,970. *Sir Ganga Ram*: What assistance or advice do you get from the Agricultural Department?—The assistance I get is in the shape of purchase of my produce, which I would not get in any other way.

34,971. Do you mean in the purchase of seed?—No, in the purchase of wheat.

34,972. You sell all your wheat to the department?—Yes, I sell it to them. If the department did not purchase my wheat, I would have to sell it at 7½ seers to 8 seers per rupee in the market, because there it will have no value for its purity or good quality. This is the assistance I get from the department. As to advice, I get what I ask for ordinarily.

34,973. Generally speaking, do the zamindars produce pure wheat?—Those who have got farms do.

34,974. But generally, do the people mix anything with it?—Yes.

34,975. Purposely?—Yes.

34,976. And do not the department advise them to keep their wheat pure?—They do, but the advice is not yet effective.

34,977. Do the agricultural officers often pay surprise visits to villages and give advice?—Yes, I have seen Inspectors visiting my farms.

34,978. Is that advice followed?—The advice is not very popular. The advice has not yet created any belief among the tenants, so the advice does not fall on good ears.

34,979. You said something about village industries. What village industries had you in mind which could be introduced into the villages?—I took two or three from the Questionnaire and another two were suggested to me by another Member of the Royal Commission. I did not think of any spare-time industry.

34,980. Not even the spinning wheel?—I am in favour of spinning wheels. I have mentioned that.

34,981. Has that been done anywhere in these Provinces?—It was being done, but it has died out.

34,982. Do you always grow Pusa 12?—Pusa 4, Pusa 12 and Pusa 52.

34,983. Have you tried the Punjab wheats?—No.

34,984. What oilseeds do you grow?—We grow *sarson*.

34,985. Anything else?—No.

34,986. Have you tried *toria*?—No.

34,987. Have you made any improvement on the white gram?—No. Gram has not been my chief crop.

34,988. Has gram been improved anywhere in these Provinces? Have they produced Kabul gram?—I think so; I am not quite sure.

34,989. As a whole, what is your experience of the boys of the rural schools? After passing two years in the primary school, do they retain their knowledge or do they immediately afterwards forget it? Those who do not take to educational work—those who go back to the land—do they keep their knowledge?—I do not think that they retain it sufficiently.

34,990. Are your communications in these districts satisfactory?—I do not think so.

34,991. What are they wanting in? In metalling or bridging or what?—Bridging; and the roads are not in good order.

34,992. Are you a member of the Board of Communications?—No.

34,993. Have you made representations about that?—No.

34,994. I want to ask you one other question. You are governed by the Talukdari Act?—Yes.

34,995. How about succession? Is that by the law of primogeniture or Hindu Law or the law of inheritance?—I think the practice is not uniform.

34,996. What is the practice?—The practice is different. In some cases it may be primogeniture, in others custom prevails and so on.

34,997. If a person wants to be governed by the law of primogeniture, can that be done? Is he not subject to the Hindu Law?—I am not an expert on law, nor do I think I am in a position to answer that question.

34,998. Now about wells. This particular well you say has given 14,000 gallons an hour? What lift was it?—The water surface of that well is about 20 feet from the ground level.

34,999. When you pumped up 14,000 gallons an hour it went to what?—It went down to 35 feet and then it stopped.

35,000. Did it not blow sand by taking away 15 feet out of the water?—No.

35,001. Was this well founded on *mota*?—Yes.

35,002. What wells did you say failed?—Sandy wells and not *mota* wells failed.

35,003. Is there no *mota* available?—In some places it is, but it is very far away.

35,004. Have not the Agricultural Department advised you about that?—Yes, but when the *mota* has been very far away the water supply has been small.

35,005. Do you get coarse sand where the water stops or is it fine sand?—I did not notice any difference between the sands.

35,006. Would this well stand pumping at the rate of 14,000 gallons an hour if you pumped it day and night?—I did not pump it 24 hours. It has been working only for about 8 or 10 hours a day.

35,007. Could you tell me the cost of pumping water per acre?—I could not tell you.

35,008. *Sir Thomas Middleton*: What is this *mota* to which you have referred?—We call it an underground stream of water.

35,009. It must be resting on clay?—Yes. Sometimes *mota* comes in *matiar*, sometimes in *bhalu*. I am not an expert in that line, but I think that sandy wells also have got strong streams.

35,010. Your rate for labour is 4 annas. That is cash payment? Is there any payment in kind in addition?—No. When the competition is high the rate goes up to more than 4 annas, but generally I get the average rate.

35,011. Is it not your custom to pay your regular workers partly in kind and partly in cash?—The custom is to pay in kind for harvesting.

35,012. Then you give them something in kind?—Yes.

35,013. What are the additional earnings in kind of the labourers at harvest time?—I do not know of any additional earning. When they are harvesting wheat they prefer to take wheat rather than cash.

35,014. What I wanted to know was, when they were harvesting wheat, whether you paid them cash and also wheat?—No cash payment, they prefer to take wheat only. They will bring a certain amount of wheat and divide it into 17 parts, out of which they take one part.

35,015. How many maunds of seed wheat do you sell in an ordinary season to the department?—This year I produced about 1,500 maunds; I do not exactly remember the amount sold to the department.

35,016. Do you have to dress your seed wheat by a winnowing machine?—I have no winnowing machine.

35,017. You winnow it by the country method?—Yes.

35,018. Do you not separate out the light seed?—We do it by laying it out in the sun.

35,019. Supposing you get 1,400 maunds from the threshing floor and remove the dust, is there anything else that you remove before sending it to the department?—We remove the dust.

35,020. Nothing else?—I do not think we remove anything else.

35,021. *The Chairman*: The small grain? That is not done here probably?—No. The process here is to take the bundles and have them beaten with sticks. Then the grain comes out and is taken to the harvesting floor. Those bundles are thrown into the threshing floor and they are threshed by bullocks tramping over them; then the *bhusa* is separated and there is some *bhusa* and some small grain mixed. The man puts them into a *supa* against hard wind and the small grains are taken out; most of the grain is taken out by beating with sticks.

35,022. *Sir Thomas Middleton*: You point out how necessary it is to have a suitable threshing machine. How many bullocks do you employ on your farm?—I have got twenty pairs of bullocks.

35,023. Are all these animals likely to be employed in the work of threshing?—Yes, for months.

35,024. Have you yourself not purchased a threshing machine?—No, because I am told that it does not make good *bhusa*, good chaff.

35,025. You do not like the chaff that is cut by the machine?—No, the bullocks do not eat it readily.

35,026. After getting the straw from the threshing machine, you can then pass the straw through a chaff-cutting machine which cuts it into short pieces. Have you not seen that implement?—No, but I have seen *bhusa* from chaff cutters; it has very sharp edges, and so it is not liked by the cattle.

35,027. I have been told by others in India that they do find this difficulty, in Britain we have no difficulty with these sharp edges?—That may be so, but here the cattle do not like it.

35,028. The only reason why you do not buy a threshing machine is that you cannot get your *bhusa* properly prepared?—Yes. And there is another reason also. It will only remain in work for one month during the twelve months of the year; it lies idle for eleven months.

35,029. But if it saves your bullock so much, as you point out, it would pay you to get one?—Economically, it will not be a great success.

35,030. That is a matter of opinion. It is worth trying, anyhow. You suffer chiefly from fodder shortage in January and February?—Those are the months in which fodder is very scarce in this country.

35,031. Do you have any of your land set aside for grass growing?—Yes.

35,032. And the supply you have available is not enough to carry you over these two months, January and February?—We do not give hay to bullocks. I have some land for growing grass which I give to horses.

35,033. Not for cattle?—Cattle do not eat it, I think. They are not accustomed to it.

35,034. But they could very easily learn to eat it?—Yes, they might, but I have not tried it.

35,035. Then you suggest that the young cattle should be castrated. Do you think that cultivators generally would agree to that in your district?—They all do castrate them and have no prejudice against doing this.

35,036. So that, if under some order unsuitable bulls were castrated, there would be no objection?—No, there would not, provided good bulls were supplied in that locality.

35,037. *Raja Sir Rampal Singh*: You are a member of the Legislative Council?—I am.

35,038. Which constituency do you represent?—I represent the Talukdars of Oudh.

35,039. Do you think that there is a general tendency in the Legislative Council for allotting money for agricultural development?—Certainly.

35,040. If the finances are satisfactory, you expect large allotments will be made for agriculture?—They have been made.

35,041. Will they be made in the future too?—In the future they will be made, provided they are to be used on useful purposes.

35,042. Do you think that at present the money that is allotted is not used for useful purposes?—It is; it is not my view that the money is being wasted; I do not say that. I even say that enough is not spent; there is more room for expansion in the department.

35,043. Is the Agricultural Department in touch with the cultivators and zamindars?—I think it is a matter of opinion. In my opinion, it is not in touch as it should be.

35,044. Is it due to its being understaffed, or is it due to any apathy on the part of the department?—I think it is very much understaffed.

35,045. You sell your seed to the department?—Yes.

35,046. And you also advance seed to your cultivators?—I do.

35,047. Do you find any apathy amongst the cultivators as regards taking up improved seed?—No, there is no apathy amongst them. The demand is growing.

35,048. But you said that nearly the whole of your produce is sold to the Agricultural Department, without anything being kept in reserve for distribution amongst the cultivators?—That is the improved wheat which I grow; other kinds I do give to my tenants.

35,049. Why do you not give this improved seed to the cultivators, if there is a demand as you say?—Those who particularly want it, come to me and take it. I do not say that I do not give it to them at all; in certain cases I do give it to them.

35,050. Do you think that the demand is great, or is it here and there only that there is a demand?—I think the demand is increasing, although it is not very great at the present time.

35,051. Is it due to the fact that the cultivators have no faith in this improved seed, or is it due to any other cause?—In places where there are no successful demonstration farms they have no faith in the improved methods, but where there are successful demonstration farms of zamindars or of Government, they have taken to going in for improved methods.

35,052. They have taken to them?—Yes, and this convinces me of the utility of successful demonstration farms.

35,053. You say in your statement that it is not necessary that the teachers in rural areas should be drawn from agricultural classes. Do you not think that those belonging to urban areas are quite unacquainted and out of touch with agricultural life, and therefore if teachers from the agricultural classes are employed they will be more beneficial?—When I said agriculturists, I had in my view other classes living in the rural areas; I did not make any difference betwen rural and urban population.

35,054. Do you mean that people who belong to the rural areas should be employed?—Yes; even those who do not belong to the agricultural classes.

35,055. Have you any knowledge of those who have come out of the Agricultural College?—Yes.

35,056. If they do not get Government employment, do they adopt agriculture as a profession, or do they seek for other jobs?—I do not know of any one of them that has taken to agriculture as a profession.

35,057. What is your general experience about these men who come out of the Agricultural College? Have they sufficient knowledge of agriculture to give proper advice and to stimulate agriculture in the country? —I have not studied the question from that point of view, but I say that when they have no particular interest in agriculture, I believe they have no particular knowledge of agriculture.

35,058. Do you mean that they are deficient in that knowledge?—Otherwise, they should go in for agriculture as a profession rather than for service.

35,059. You say in your note that these agricultural institutions in rural areas should be administered and financed by District Boards and the Government?—Yes.

35,060. Do you not know that the District Boards suffer from financial stringency?—That is why I have added Government.

35,061. You know that the Government is in the same position, as they have to pay contributions to the Imperial Government?—Yes. We have been repeatedly requesting the Government of India through this Government for a reconsideration of the question of our contribution to the Government of India.

35,062. This year you have had a profit of about 75 per cent.?—Yes, I think it is more.

35,063. Was this the case in previous years also, or is it a special case this year?—The profit has been quite good in the previous years, but it has been on the increase, and the figures which I gave are for the last year.

35,064. I believe there are many other farms in your district?—There are.

35,065. What is your knowledge about them? Do they also have the same profits every year?—I cannot say anything with authority, but my information is that they are not doing well, excluding one more which is doing very well, and that belongs to you.

35,066. The others are not doing well?—The others, I am afraid, are not doing very well.

35,067. May I ask you what other difficulties the cultivators have in getting *taccavi* from the Government? Do they have to pay more in the shape of tips?—Yes, illegal payments. I mean illegal payments when I use the word harassment.

35,068. They have to pay tips to several persons at the time of taking *taccavi*?—My object in using the word harassment was to convey the idea that they have to make illegal payments.

35,069. You think that, at the time of taking *taccavi* and at the time of repaying it, the cultivators have to undergo great hardship on account of other payments they have to make?—Yes; and in spite of the concession which the Government makes in interest, the cultivator has to pay more than what the moneylender gets from the tenant.

35,070. It is swallowed by others?—Yes; that is what I think.

35,071. Do you think that the indebtedness of the agriculturists is to some extent due to very small incomes from agriculture?—It is; that is one of the chief reasons.

35,072. You say that the consolidation of holdings is very difficult in these Provinces. What are the difficulties?—The chief difficulty is that the cultivator requires several sorts of land which cannot be found at one place. For instance, rice land, *dumat* and *bhul* land cannot be consolidated in one.

35,073. Do you mean to say that economically it suits the cultivator to have land in different zones, so that when there is heavy rainfall he can get some produce from lands which require that rainfall?—I follow you; that is right.

35,074. Do you think that subdivision can be stopped by making an amendment in the law of inheritance?—That will be one way of preventing fragmentation and subdivision.

35,075. Is the present rent law encouraging subdivision? Some heirs have been fixed by the law, and all of them are sharers of that holding whenever the tenant dies?—Yes. In this way it leads to subdivision.

35,076. Has any power been given to the landlords to keep the holding intact if they wish to do so?—No.

35,077. You perhaps know that in the preparation of *ghi*, a large quantity of cow-dung is consumed?—Yes, in the shape of *kanda*.

35,078. It is not only for cooking purposes that cow-dung is used, but even for *ghi*-making purposes?—Chiefly for *ghi*-making purposes. For cooking, fuel may be substituted, but for *ghi*-making and boiling milk *kanda* is the chief thing.

35,079. *The Chairman*: Will you please explain that?—If fuel is used for preparing *ghi*, it does not produce as good *ghi* as when *kanda* or dried cow-dung is used.

35,080. How is that?—That is the practice.

35,081. Can you explain it at all? What is the particular virtue of cow-dung in the preparation of *ghi*?—It does not give so much smoke and such strong heat as fuel.

35,082. It gives slow fire without smoke?—Yes.

35,083. *Raja Sir Rampal Singh*: You may have heard that in some districts such as Gorakhpur, the zamindars have come forward in large numbers to have machinery for sugar-making and other things?—Yes.

35,084. You think that if it be proved that the use of machinery is profitable, the talukdars and zamindars will not hesitate to go in for it?—That I have maintained all through in my statement.

35,085. Have you found any difficulty in getting advice from headquarters, especially from the Engineering Department, about the sinking of wells, the setting up of machinery, or anything like that?—We do get advice. I think there is a great lack of engine drivers. I know of a case where a well has lately failed. The man applied for an engine for a short time, because there was no other way, and the engine was supplied, but the driver was not available; he had to find his own driver for a very short period.

35,086. *Sir Ganga Ram*: What amount of pay would you be prepared to pay to the engine driver?—A reasonable amount.

35,087. What do you consider a reasonable amount?—I think drivers are paid from Rs.20 to Rs.30; that is the *mamul*.

35,088. Is the system of letting loose Brahmani or religious bulls still in vogue in this Province?—Yes, it is.

35,089. Is it not stopped by law?—No.

35,090. You would not advise stopping the practice by law, because they spoil the breed?—Something is better than nothing; where there are no bulls, these bulls will do some good. Why should you stop the practice by law?

35,091. When you say that boys from the Agricultural College do not take to agriculture as a profession, naturally they will say that they have no land to go to. What remedy do you propose for it?—What about those who are agriculturists?

35,092. Every one is not an agriculturist. What method would you propose for those who are not agriculturists?—When I said that, I had sons of agriculturists in mind.

35,093. Those who had land?—Yes. I do not know any of them that has taken to agriculture as a profession.

35,094. You grow *juar*?—Yes.

35,095. As a fodder or as a cereal?—As a rotation crop.

35,096. You take the grain?—Yes.

35,097. You do not grow it only for fodder?—In some cases it is grown for fodder, but then it is grown early in the month of May and cut down by August.

35,098. You said that you had great difficulty in finding suitable fodder in the months of January and February. Why do you not grow *sagis*?—I do not know what it is.

35,099. It is a kind of clover. It feeds cattle in January and February, and it is a good leguminous crop?—I have raised this question so many times in the Legislative Council, but nothing has yet been done in that connection as far as I know.

35,100. *Raja Sir Rampal Singh*: Is there general scarcity of fodder in your district?—You mean grazing grounds? Fodder in what shape?

35,101. Is there general scarcity of fodder in any shape?—Sometimes there is and sometimes there is not. Fodder in the shape of *bhusa* this year is not scarce.

35,102. *Professor Gangulee*: You say you sell your seed to the Agricultural Department. Are your seed farms inspected by that department?—Yes. It is not a seed farm, it is a demonstration farm, and I sell the produce.

35,103. I understand you grow one variety of Pusa wheat?—I have been growing two varieties for some time, and last year I tried a third.

35,104. Your farm is inspected by the Agricultural Department and you sell the whole of your produce to them?—I do.

35,105. What price do they pay for wheat?—They paid me 6½ seers per rupee this year.

(The witness withdrew.)

The Commission then adjourned till 10 a.m. on Wednesday, the 2nd February, 1927.

Wednesday, February 2nd, 1927.

LUCKNOW.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.

Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.

Professor N. GANGULEE.

Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries.*)

Mr. B. D'O. DARLEY, C.I.E., I.S.E., Secretary to the Government of the United Provinces, Public Works Department, Irrigation Branch.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (*i*) The necessity for a special irrigation research division has been recognised for many years. Unfortunately, the Irrigation Department of these Provinces has been so short-handed that no suitable officer could be spared. The question of opening an experimental division with an agricultural sub-division was raised in 1917, but reluctantly dropped because so many officers were on military duty connected with the War. Before many of these officers had returned, the Sarda canal construction had been commenced, and it is with the greatest difficulty that the thirteen new divisions on the construction of that canal are being manned at present. Now that work is nearing completion the question of forming a research division will be taken up in the immediate future.

(*c*) There is a vast field open for inquiry apart from the design of canal works. The most important of these is undoubtedly a study of the means by which water can be economised and irrigation extended with the supplies at our disposal for existing canals. Almost all sources of supply have been tapped wherever irrigation is needed in these Provinces. Only by economising water in these areas will it be possible to extend irrigation facilities for further cultivation.

It is estimated that only about 50 per cent. of the water entering a large canal system reaches the cultivators' fields, and then more than is

necessary to mature the crops is invariably given. It is estimated that 1,500 c. ft. per second will be lost by evaporation and absorption from the main lines of the Sarda canal, enough to maintain 300,000 acres during the *rabi* season. There will be further losses in the distributaries, and last, but by no means least, losses in the cultivators' watercourses. The question of minimising the losses from an irrigation channel has been engaging the attention of canal officers not only in these Provinces, but all over India for years. Something has been done by designing canals with flat bed slopes where the soil is very porous; this causes silt to settle into the pores and check the seepage losses. Apart from this, no means have so far been found which are efficient, durable and at the same time sufficiently inexpensive to be an economic proposition. Until this problem can be solved, it will be necessary to obtain water by economy from the three following sources:—(1) cultivators' watercourses, (2) more efficient distribution, (3) amount of water given by the cultivators to their fields.

To take these in turn:—

(1) *Cultivators' watercourses.*—On all new canal systems the main watercourses are being constructed by Government at the same time as the canal; they are therefore the minimum length required and laid out to the best advantage. On all the older canals the cultivators dug their own watercourses, and many of these twist and turn unnecessarily and are not on the best alignment. Much could be done by straightening these, and by reducing the length at the same time to reduce the absorption losses.

(2) *More efficient distribution.*—In the old days when there was a demand for water, all distributaries were run continuously and, when the supply of water was short, reduced supplies were given to all channels equally. Much has been done to minimise losses by opening distributaries alternately and running them with full supplies for shorter periods, generally one week at a time. The week has long been the accepted unit and the size of outlets has been fixed accordingly. Cultivators understand this unit, and it would be difficult to alter matters now; at the same time it is a known fact that an outlet of a certain size running for any fixed period will irrigate a larger area than an outlet of half the size running for double this period. For this reason, some officers consider that it would be advantageous to have a five-day running unit, longer closures and larger outlets. Most careful measurements would have to be made by a research officer before such a drastic step could be taken.

Considerable economy has been effected during the past thirty years by turning large cultivators' watercourses into Government minors, and now cultivators seldom have control of a watercourse drawing more than one cusec. For this reason most officers consider modules unnecessary, since the size of outlets is fixed according to the area to be irrigated and they are always set a certain depth below the full supply level in the distributing channel. Further experiments are however required to see if, even so, modules would not effect a useful economy.

(3) *Amount of water now given to crops by the cultivators:*—The cultivator undoubtedly gives far more water than is necessary when flow irrigation is available. Where he has to lift water from tanks, wells or canal watercourses, he prepares his fields most carefully, splitting them up into small compartments and watering each of these in turn with the greatest care. In such cases it is estimated that he uses only half the quantity, often with an equally good outturn of crop. For this reason many officers have advocated lowering all Government canals till the cultivators are compelled to lift water to their land.

Mr. B. D'O. Darley.

Efforts have been made to force the cultivators to economise water. Fines were instituted some thirty years ago when fields were not split into compartments or *kiaris*, and the same experiment was tried once more a few years ago. On each occasion most of the cultivators preferred to pay the fines and very large sums were collected. This caused considerable resentment without effecting the hoped-for economy, and the effort was therefore abandoned in each case after a trial for a few *faslis*.

Undoubtedly the best means of checking wasteful methods would be to sell water by bulk, but here the difficulties in almost every case are insurmountable. Holdings are so small that every watercourse supplies numbers of cultivators, all of whom would have to have separate meters to gauge the water used by them. There are over 50,000 watercourses taking off canals in these Provinces and the question of supplying a number of meters for each would appear impossible at present. A research officer with time and money to develop experimental ideas might eventually overcome the obvious difficulties even in this case.

One of the chief duties of a research officer would be to keep in touch with modern irrigation practice not only in other Provinces, but also in other countries. The science of irrigation is developing year by year in America, South Africa, Australia and elsewhere, and little is done at present to collect and record the experience gained in different parts of the world.

In India, irrigation is far too provincial and there is little interchange of ideas between one Province and another. The Institution of Civil Engineers (India) was supposed to remove, to a certain extent, this disability, but, for reasons it is unnecessary to mention here, this institution is not popular amongst P.W.D. officers and very few have joined. Also, embracing as it does all classes of engineering, irrigation can only find a place among many other subjects which have little or no interest for irrigation engineers.

Engineers in India have always been diffident about publishing the result of their experience, priding themselves that they do their work without advertising. Any notes that have been written have rarely gone beyond the local Secretariat, where invaluable matter is buried in such a manner that after a year or two it is often entirely forgotten. The world at large knows little of the great irrigation works of India, and officers of one Province often know nothing of what is being done in an adjoining Province. Mistakes are made and money is wasted because experience gained is unknown outside a limited circle and often forgotten altogether.

The Punjab has got a local Engineering Congress, which, by reason of the fact that the majority of the Engineers in that Province are irrigation officers, has advanced the science of irrigation engineering enormously. Bombay has also got an Engineering Congress, but the subjects dealt with are often of little interest to the irrigation engineer.

There is a crying need for an All-India Irrigation Congress with headquarters and a library at some central place like Delhi, where notes and papers already written would be collected and tabulated and members from all Provinces could meet, read papers and exchange views, and so dissipate the provincial spirit which is such a bar to progress at present.

The obvious head of such a congress would be the Consulting Engineer to the Government of India. Under him would be an assistant who should be selected most carefully from amongst the keen engineers of one of the provinces; this assistant would act as librarian and would keep in touch not only with the research officers in the various Provinces, but also with the irrigation practised in America, Australia and elsewhere.

This proposal was brought forward in 1925 and was welcomed by all Irrigation Engineers of the various Provinces consulted. It was therefore

forwarded demi-officially to the Acting Consulting Engineer to the Government of India but nothing has been done pending the decision on the question of the continuance of that post. It would be little short of a calamity if this post is abolished, and this liaison officer, in touch with every part of India, is not available to advise provincial officers and keep them in touch with improvements found possible elsewhere. Without such an officer of ripe experience to direct the librarian, organise the annual meetings and generally superintend the whole organisation, an All-India Irrigation Congress cannot progress satisfactorily. The knowledge gained by local research will not be properly discussed and disseminated, and irrigation practice will remain provincial as at present.

The above paragraph also answers the point raised in Question 4 as to the means by which the Government of India can aid and supplement the activities of the Local Governments.

QUESTION 8 IRRIGATION—(a) A map* showing the areas (painted blue) commanded by canals already constructed or under construction in these Provinces is attached. Although these canals cover a very large area, the percentage of the gross commanded area irrigated is very small. Thus on the Upper Ganges canal only some 1,100,000 acres are irrigated annually out of a gross command of 5,350,000, or 21 per cent. On the Lower Ganges canal this percentage is 14, on the Eastern Jumna canal 23, and on the Agra canal only 19 per cent. A considerable amount of this commanded area is unsuitable for irrigation, either because it lies too low or is too sandy, but undoubtedly irrigation could be usefully extended to a very large area if water were available. As already stated, the remaining large tracts are either unsuitable or do not need irrigation, or there are no supplies available.

The largest of these tracts lies north of the Sarda river and comprises the districts of Bahraich, Gonda, Basti and Gorakhpur. The rainfall of these districts is heavy and spring level is high. Crops can be grown without irrigation in most places, or where this is needed wells can be sunk at a very small expenditure. The larger perennial streams have been examined, but any canals proposed have met with determined opposition and have been shelved as not required.

A large area between the Sarda and the Ganges in the districts of Ballia, Ghazipur and Azamgarh are somewhat similar and will never require canal irrigation. The upper part of this *doab* will be irrigated by the Sarda canal now under construction. Opinions have varied regarding the necessity for this canal since first it was proposed in 1870. Spring level is usually high, but after a succession of dry years it falls rapidly and the demand for canals arises, to disappear once more after a few years of good rainfall. For this reason scheme after scheme has been prepared in the past, to be abandoned before construction was started. The present scheme is well under way, and it is anticipated that it will be open for irrigation in 1928.

The lower portion of the *doab* is less in need of irrigation; it can however be commanded by a Lower Sarda canal; the feasibility of this scheme has been established by careful investigation; it is however being held in abeyance until the upper canal has solved by actual experience the knotty question as to whether canal water is likely to be utlised sufficiently to warrant this further costly extension further east.

The only other large unirrigated tract north and east of the Ganges lies in Rohilkhand in the districts of Bijnor, Moradabad and Budaun. There was previously a proposal to build an Eastern Ganges canal for this area, but this has been abandoned since all available water in that river is more

* Not printed.

urgently required in the Ganges-Jumna *doab*. The only other large river in the tract—the Ramganga—has been investigated more than once, but any schemes prepared have always been abandoned because the supply in this river falls to an almost negligible quantity in the cold weather when water would be most needed for *rabi* and sugarcane irrigation.

All the small streams in Bijnor have been fully exploited and every drop of water is utilised at present. The possibility of constructing two small canals from the Gangan and Sot rivers in Moradabad and Budaun respectively is under investigation; apart from these no further works seem possible.

The Ganges-Jumna *doab* already discussed is fully commanded by canals, and it only remains to consider the tracts lying south of the Jumna river, viz., Bundelkhand and Mirzapur. This country is for the most part covered with wild rocky hills and the rivers run dry shortly after the rains cease. Irrigation of such land as is suitable entirely depends on tanks and storage works. Such schemes are expensive and can only be constructed where protection is urgently required as an insurance against famine. The Betwa canal was the only irrigation work south of the Jumna at the beginning of this century; since then every large river has been tapped and hundreds of small tanks constructed and some Rs. 250 lakhs all told have been spent. These works result in a net loss to Government of some Rs. 5 lakhs to Rs. 6 lakhs each year. A certain amount still remains to be done; further reservoirs have been proposed on the Betwa and Dhasan rivers to supplement those already in existence and so allow a further extension of irrigation. A few smaller storage schemes have also been proposed—the Ohen and Paisuni canals in the Banda district and the Belan canal in the Allahabad district. These schemes cannot be made paying propositions, and as they are really only required urgently in famine years, they must wait until money is available.

Apart from these works, there is endless scope for small tank schemes. In most cases these can best be taken up as famine relief works when opportunity permits.

This general survey of the irrigation possibilities and necessities of these Provinces has been given to show that no large advance of canal irrigation can be looked for after the Sarda canal has been completed. Undoubtedly the most important point to be studied at present is the extension of irrigation with the supplies available in existing canals, and this question has been fully discussed above under the heading "Research."

If existing river supplies have been all but fully utilised where irrigation is needed, there is one source which must some day be tapped if the soil is to be made to give the maximum yield possible.

Except in the rocky country south of the Jumna there is an inexhaustible reservoir in the subsoil close below the surface. The cultivators themselves have built innumerable wells in every district, but the yield from these surface wells is small and the means by which the water is lifted primitive and expensive. The Agricultural Department have sunk a large number of tube-wells of late years and their activities continue expanding. This branch has so far been left to that Department, but the time is now at hand when the canals should be called upon to supply hydro-electric power for lifting water on to land which cannot receive canal supplies, or, where conditions are favourable, substituting pump supplies from tube-wells for existing canal supplies, which could then be freed for land elsewhere. The great obstacle in the past has always been the fact that canal irrigation rates are so low that if applied to pumped supplies the pumping scheme became unremunerative. It is difficult also to have two sets of irrigation rates in adjoining land, one for canal irrigation and one for irrigation from pumped

supply. The State also cannot undertake unremunerative works except as a famine protective measure. Until therefore the cultivator is willing to pay a much higher rate for a pumped supply, it will be difficult to advance far in this direction. When he realises the advantage of such irrigation and is willing to pay a fair percentage on the capital outlay on such schemes, then there is an unlimited field for expansion and all manner of pumping schemes from tube wells and from low-lying rivers can be taken in hand as capital can be made available.

(*b*) The points raised in this question have been fully dealt with under the heading " Research."

Oral Evidence.

35,106. *The Chairman.* Mr. Darley, you are Secretary to the United Provinces Government in the Irrigation Department?—Yes.

35,107. Would you tell the Commission whether you think the touch between your own department and the Agricultural Department is as close both at headquarters and in the districts as you could wish?—I have never had any reason to suppose that it was not. When one comes to think of it now that the point has been brought forward by the Commission, I should say that something more perhaps might be done than has been done in the past, especially in the matter of well irrigation; we have left that entirely to the Agricultural Department.

35,108. You deal with that in your note. I suppose it is, broadly speaking, true to say that every irrigation problem has its agricultural side?—Yes. One thing that I have brought forward in my note is that we want a research division. In 1917 we brought up that question. At that time it was proposed to have an agricultural subdivision of that division. That, I think, would be a very good thing.

35,109. Do you divide your existing schemes of irrigation under the two heads of " productive " and " protective " in these Provinces?—Yes.

35,110. I think we have complete information in the various papers that have been provided?—Yes. Roughly, we may say that all schemes north of the Jumna river come under the head of " productive," and all schemes south of the Jumna river in Bundelkhand would come under the head of " protective." If the schemes north of the Jumna river are not productive, they were built with the hope that they would turn out to be productive. A few have not turned out to be productive.

35,111. Have they been definitely changed over to the protective list?—Some are about to be changed over. For instance, in Rohilkhand they are about to change over some schemes to the non-productive list.

35,112. They having failed to produce the necessary returns?—Yes.

35,113. Before I turn to your note of evidence, I do not know whether there is any other matter that you would like to place before us in amplification of what you say there?—I do not think there is anything else.

35,114. Do you think a central research station dealing with the fundamental problems of irrigation under the Government of India would be helpful?—I have dealt with that I think fairly fully in my note, under Research. I think it is not only helpful but absolutely essential that we should have a central organisation which would bring together the experience gained in other Provinces so that it could be utilised all over India.

35,115. Yes, I have read your note with care. I was not quite sure whether you wanted a central body actually to carry on research?—No,

I think we must have provincial research and that information collected together at a central point.

35,116. You do not think these basic problems are of general application throughout the irrigation schemes?—The conditions of irrigation in every Province are so very different. In the Punjab you have got 10 to 12 inches of rainfall a year and they think almost entirely in wheat. In the Central Provinces and Bengal they think altogether in rice. Here we consider that sugarcane and wheat are the most important crops, whereas in the Punjab I think I am right in saying there is comparatively little sugarcane.

35,117. Take the problems of salinity, of water-logging, or seepage and the problem, which you refer to in your note as requiring further research, as to whether it would not be better to irrigate through larger outlets for a shorter time; are not those fundamental problems which might be dealt with by a central research station?—Yes, but I think it would be better to deal with them in different Provinces and then see if our results agree.

35,118. You do not think a central research station, if it could be devoted to useful service, might give life to the central organisation which you yourself are eager to create?—Certainly it would be a help, but it is not so essential as having these provincial research stations which would deal with local problems.

35,119. Is there not a little danger that when one is discussing these matters in theory the diagrammatic idea rather supervenes and one perhaps forms the notion that material for research is like a cake and there is not enough to go round? Is not the position really that there is so much to investigate in the future that, provided there are reasonable arrangements between the various bodies, whether central or provincial, there is no reason to fear overlapping at all; is not that rather the position?—I do not think overlapping in this case would do much harm, because any overlapping would tend to corroborating results obtained in other Provinces. A central research station would certainly be of enormous advantage.

35,120. I rather judge from your note that you are of opinion that your own department should take over the responsibility for well irrigation?—I am sorry if that impression has been given. I do think, however, that we might take over from the Agricultural Department the matter of canal hydro-electric well pumping schemes, but that is a big problem.

35,121. Could you work a joint scheme with the Agricultural Department if you were engaged in popularising the use of mechanical lift irrigation and also attempting to develop wells in areas now served by canal water, in order to conserve the canal water for areas lower down the system? Do you think it would be feasible to to devise a scheme of development of that sort between your own department and the Agricultural Department?—It would be rather difficult to combine; we would do all we could to help the Agricultural Department, but if they came in, the scheme must be under their direction.

35,122. Then are you definitely of opinion that the well irrigation side should remain with the Agricultural Department?—Yes, I think so at present; we have not got the staff to take up any further work and it also goes outside the canal area; well irrigation extends over the whole Province.

35,123. Do you see any prospect of the volumetric basis of charge being adopted in this country?—I am afraid not. In this Province the holdings are so very small that the difficulties of volumetric measurement for each

holding make it impossible. If we ask the larger landholders to take water by volume and distribute it, the distribution will cause many complaints from the cultivators who will not get their fair share of water.

35,124. On page 159, in answer to Question 8 (*a*), you say: "The Agricultural Department have sunk a large number of tube wells of late years and their activities continue expanding. This branch has so far been left to that department, but the time is now at hand when the canals should be called upon to supply hydro-electric power for lifting water on to land which cannot receive canal supplies, or, where conditions are favourable, substituting pump supplies from tube wells for existing canal supplies, which could then be freed for land elsewhere." I rather gathered from that sentence that you thought there ought to be a transfer of certain responsibilities from the Agricultural Department to your own?—No, I think it is more a question of the Canal Department taking on new schemes for well irrigation in conjunction with hydro-electric installations worked from canal falls; there we could take over the well irrigation. That, of course, is very nice in theory, but in practice there are insuperable difficulties, because you cannot make this pay at the present irrigation rates. If Government take it up, it would have to be as a non-paying proposition.

35,125. It is difficult to conceive one set of cultivators paying a low rate for canal-carried water, while their neighbours are paying a higher rate for lifted water?—That is the whole problem; we are faced with that difficulty.

35,126. Is there any hope of any extension on these lines unless you level the charges down, raising the canal rate and keeping the lift rate where it is?—Any raising of canal rates has always been opposed very strongly in the local Council. We hold that our irrigation rates are low; they are slightly lower than in the Punjab. If our rates could be raised slightly, one might take the rough with the smooth, and lose a little on the well irrigation.

35,127. This Commission is debarred by its terms of reference from considering the charge made?—But the two questions are bound together.

35,128. To what extent does the Council control the irrigation water rates?—They have no control whatsoever over the water rates, irrigation being a reserved subject, but still the Government do not charge more than they have to, and they like as far as possible not to go against the will of the people in this matter if they can afford not to.

35,129. Do you find that the Council takes an active interest in the matter?—It takes a very active interest in the matter of irrigation rates.

35,130. Have there been debates on the question?—There have been several questions and debates with regard to irrigation rates. The rate for sugar cane, for instance, has been twice raised and twice lowered owing to questions being raised in the Council.

35,131. *Sir Henry Lawrence*: Was a resolution passed in the Council?—I think I am right in saying there have been resolutions passed in the Council with regard to it, but I should like to look that up to make absolutely certain. There have been questions raised.

35,132. *The Chairman*: Are you at one with the Agricultural Department as to the amount of water required for each crop?—Yes, I think so; but I do not think either of us know definitely what is the exact amount of water which should be given.

35,133. Would that be a useful line of research?—That is one of the first lines of research which is absolutely necessary; I think Mr. Clarke is just about to make some experiments on that very point.

35,134. In the meantime, speaking generally, and setting aside the Sarda scheme, I gather from your note that you think it is in well irrigation

that development must in the main to take place?—Well irrigation and economy of water on existing canal schemes; that is where research is necessary, to see how we can economise.

35,135. Have you worked out for any particular area what would be possible in the way of extended irrigation if you could persuade cultivators in the higher reaches of the system to exploit the subsoil water rather than to take their full share of the canal-carried water?—No, I do not think anything of that description has been done; I do not think they would forego their rights.

35,136. There, again, you are up against the difficulty of expense?—Expense is one thing, but the cultivator will never exchange the canal water for well irrigation, and we would be faced with the difficulty of altered values of land.

35,137. That suggestion has been made to the Commission from various sources, but you yourself do not think it is feasible?—I do not think it is feasible, because the mortgage rates have changed with the introduction of irrigation; if you say they have got to take their water from wells, all the mortgage values will depreciate.

35,138. Have you anything to say as to the practice of the average cultivator in relation to irrigation in this Province? Are the cultivators reasonably careful of the water?—We tried to force them to economise the water by imposing fines if they waste it, but where they have got flow irrigation they take as much water as they possibly can, irrespective of whether it is absolutely necessary for the crop.

35,139. Is the practice of making *kiaris* general?—We have tried that twice; about twenty years ago an effort was made to force the people to make *kiaris* so as not to waste so much water. Those attempts failed; the people preferred to pay the fines and not make the *kiaris*, on each occasion. Then we found it was possible for the petty canal officials to use this as a means of getting at the unfortunate cultivator, the *kiaris* were not made, the water was wasted as before, and it was only a case of Government getting a little extra revenue, while Government desired to spread the water to cultivators who had not got it; the water did not go to the cultivators who had not got it; it was wasted as before. It was tried again five years ago with the same results and so fines were abolished.

35,140. Do you have many complaints from cultivators as to the action of subordinate members of your service in relation to petty exactions and matters of that sort?—No, very few indeed. There is always a certain amount of underhand work, but there are few complaints, and the subordinates know very well that they will be turned out at once if they are caught.

35,141. *Sir Ganga Ram*: You will admit that you have got sufficient rainfall in this Province to make it possible for every inch of the ground to grow crops?—Practically everywhere.

35,142. The difficulty arises in regard to the unequal distribution of rainfall?—Yes, for certain classes of crops.

35,143. You are aware of the fact that there are 10,000,000 acres of cultivable waste land in this Province?—It depends on what you class as cultivable.

35,144. I am quoting figures of the Government of India?—I know certain districts where the Settlement Officers are unable to say whether land is cultivable or not. For instance, in the districts of Lucknow and Unao there are vast areas of *reh* and *usar* soil, which the people in some years are able to cultivate but in other years are not able to cultivate. I know one settlement officer classed such land as half cultivable and half uncultivable.

35,145. Could you give us any idea as to how much of that 10,000,000 acres is Crown land and how much belongs to the people?—Government has very little land of its own.

35,146. Does all that 10,000,000 acres that is put down as cultivable waste belong to the people?—Yes. Also, I do not know exactly what is classed as cultivable waste. Perhaps Mr. Pim could tell us whether, for instance, land under water is so classed.

35,147. *Mr. Pim*: No, it would not include land under water; land which it is impossible to cultivate would not be included. The bulk of the waste is cultivable waste; it is only limited areas which are really uncultivable?—There are very limited areas which are cultivable which are not taken up in this Province.

35,148. *Sir Ganga Ram*: I will ask the Revenue Secretary?—Yes, he might be asked about that.

35,149. Do you also know that at present there is only ·20 irrigated protected area per head in this Province, whereas it ought to be 0·4 according to the Famine Commission's Report?—Do you include well irrigation?

35,150. Yes, including well irrigation?—No, I do not know that figure definitely.

35,151. That shows what scope there is for extension of both well and canal irrigation?—Yes.

35,152. Have you considered the question as to whether, if all your rainfall is equally and evenly distributed and according to seasons, every inch of ground could not raise some crop or other?—Yes, it could.

35,153. Can you make a calculation as to how far you allow your rivers to run to waste?—One could make a calculation of that description. For instance, the Gogra river, the biggest river perhaps in Northern India, carries from 10,000 to 12,000 cusecs in the cold weather; but we do not tap it at all because it lies too low. Do you call that running to waste?

35,154. It may be a waste to your Province though of course it might be used elsewhere. Tell us how much water you allow to be wasted from your Province; will you give us the calculation river by river?—Yes.

35,155. *The Chairman*: I suppose that is quite apart from the question whether it would pay to use that water?

35,156. *Sir Ganga Ram*: Yes. At present your productive schemes pay 6 per cent.?—Yes.

35,157. Does this 6 per cent. include the enhancement of revenue?—Yes.

35,158. In sending up a protective scheme do you observe all the conditions mentioned on page 32 of the first part of the Irrigation Report?——

35,159. Five factors are given there:—

"The direct protective value of an irrigated area, or the capitalised value, at 25 years' purchase, of the saving in average annual cost of famine which will be effected by every acre brought under irrigation.

"Estimated total cost of famine in the given tract for a period of 25 years, or quarter of a century.

"Population of the tract, with necessary addition for prospective increase.

"Area in acres which should be protected by irrigation for each head of the population.

"Area in acres already protected."

They have given there a very good formula; 6 per cent. is not after all the only criterion?—When you send up protective schemes the 6 per cent. criterion is not considered at all.*

* See also Appendix on page 745.

35,160. My object in drawing your attention to this fact is that, if you calculate your works under this formula, many of your protective works will become productive. Has the attention of Government been drawn to that fact?—If it is necessary; even in the Sarda Canal Report that point was taken into consideration, and the famine expenditure for the area was given in detail in the Report.

35,161. It has been represented to me that some very important schemes are often thrown out simply because only the direct return and the indirect charges are taken into account and they do not take into account the other items which I have mentioned above?—I do not know of any scheme that has been thrown out for that reason.

35,162. Many of the Provinces have been obliged to throw out their schemes for the reason I have mentioned. If that is so, would you recommend that that question may be considered by the Government in that light?—I certainly think that we should take credit for some famine expenditure, but Government does take all that into account.

35,163. It has been represented to us that several important schemes which may protect large areas are thrown out simply because these are the only two factors which are taken into account?—I do not think that has happened in this Province. The Province has gone ahead with irrigation in the last twenty years as far as financial conditions permit.

35,164. What are the months in which you consider there is dearth of water?—If you are taking the perennial canals, the dearth of water begins from January and lasts through February and March; the snow water begins to come down towards the end of April and then there is sufficient supply.

35,165. So there are four months, January, February, March and part of April in which there is dearth of water?—Yes.

35,166. And in these four months, do you put in sugarcane which is the main crop of this Province?—Yes, but I would not call it the main crop; it is an important crop.

35,167. Have you thought of supplementing the supply by wells and subsoil water?—Yes.

35,168. Have you considered the hydro-electric aspect of the question? How you could raise the water and so on?—We have considered that so far as to satisfy ourselves that it would not be a paying proposition from the Government point of view; if the people are willing to pay higher rates, then it might be done.

35,169. Are your rates higher than those in the Punjab or lower?—Lower; let us take Western Jumna canal and compare it with our Eastern Jumna canal. The rate for the Punjab sugarcane is Rs.12 and ours is Rs.10; for wheat their rate is Rs.5-4-0 and ours is Rs.5; for cotton their rate is Rs.3-8-0 and ours Rs.3.

35,170. Do you think there will be opposition in the Council if you attempt to bring up the rate to the level in the Punjab?—They were raised to the same level in some cases. The rate for sugarcane was raised to Rs.12 but owing to the opposition in the Council it was again reduced to Rs.10.

35,171. Do you allow water for green manure crops free or do you charge for that also?—We charge for water on all occasions, excepting for filling tanks for watering cattle.

35,172. For green manure?—I do not know if any quantity of green manure crops are grown in this Province; the question of a reduced rate has not arisen at any rate.

35,173. You have no favourable rates for the growing of fodder? Recently in the Punjab we have reduced the rates for water required for the growing of fodder, up to a certain limit?—The question has never arisen in this Province nor is it such a vital one here as in the Punjab, seeing that the rainfall is much higher here.

35,174. So people do not suffer very much from want of fodder?—Not so much except in exceptional areas.

35,175. In the winter season they must suffer from want of fodder?—At the present time they are feeding the cattle on the *juar* stalks and such things.

35,176. But you must mix it up with some green stuff?—This is not done in many parts of this Province; at any rate the question of a preferential rate has never come before the Canal Department.

35,177. Suppose there are two crops grown at the same time, for instance, gram and oil seed, do you charge for the two crops or only one?—We charge for only one crop.

35,178. You do not charge for two?—No, only for one crop, whichever is of the higher grade.

35,179. This question arose in the Punjab in this way: we generally sow there gram and oil seed together; we cut the oil seed at the end of December and they were charging us twice?—When two crops are grown at the same time, we only charge for one crop, whichever is of the higher grade.

35,180. Not necessarily whichever is cut first?—No.

35,181. *Sir Henry Lawrence*: If one of the crops takes a longer time to grow, then how do you charge?—The only such case I know of here is where *arhar* is grown with another *kharif* crop; they have both the same rate and that one rate is charged for both.

35,182. *Sir Ganga Ram*: Perhaps the problem here is not the same as it is in the Punjab. There, in the *rabi*, we generally put in many things; for instance, we grow clover with so many other crops, and so they used to charge two rates for the two crops?—It is not done here.

35,183. As regards the rates, of course in Bombay they charge Rs.50 for sugarcane?—That is a different kind of sugarcane.

35,184. What is the amount of water required to mature sugarcane?—They take five waterings of about 4 to 6 inches each.

35,185. Five waterings will not mature sugarcane, will it?—It is sufficient here. At present, if you take the area under Sarda canal, half the area under sugarcane is not watered at all.

35,186. I want particularly to draw your attention to pages 32 and 33 of the Irrigation Report so that in future you may try to get many schemes passed?—We do do this at the present time.

35,187. Do you think that the extension of irrigation in this Province has to a certain extent ameliorated conditions here? Now that the Sarda canal has been commenced can you tell me whether that figure of ten years will be reduced to six or five?—I do not anticipate any change.

35,188. Therefore, it is all the more necessary to think out some method to get over the trouble of drought. Somewhere I have seen it stated that the United Provinces are always praying for drought so that the Canal Department may profit? Sometimes the zamindars do not take any water?—Yes; it is a fact that the people do not take water in many areas when there is a heavy rainfall.

35,189. And your return is very low?—Yes, but Government makes up for that under land revenue. In such years, no remissions of land revenue are given and *taccavi* advances are not required.

35,190. Why I am giving these illustrations is because it is all the more necessary to protect your areas by some method, either by hydro-electric pumping schemes or by tapping subsoil water?—Yes, in the areas which need it and have already been tackled, but if you take the country which has not been tackled by irrigation, the area north of the Gegra river in Oudh, there the people are quite indifferent to irrigation.

35,191. Why?—Because in most of the areas they do not want it. Take, again, the district of Pilibhit; there, also, in many parts the people do not want irrigation canals.

35,192. Are you aware of what we are doing in regard to well irrigation in the Punjab? The idea is to keep the power in one place and to spread it by means of compressed air to different groups of wells which may be, say, about two or three miles apart. We are now generating enormous quantities of electricity in the Punjab, and the idea is, by means of this compressed air, to place *barani* lands under irrigation from subsoil sources. Have you studied the scheme recommended for hydro-electric power by Mr. Meares?—I have seen his recommendations, but we are always up against the economic difficulty.

35,193. Has any step been taken in this Province in that direction?—No steps have been taken because, as I said just now, we are up against the economic difficulty. The Government cannot afford at the present time to go ahead in this direction because it would not be a paying proposition.

35,194. It would certainly be paying for the country though not for the Government. If you apply the formula which is given on pages 32-33 of the Irrigation Report you will see that the Government will be forced to agree to that, whether it is directly paying or not, and therefore that scheme applies also to this hydro-electric power?—This Government cannot be regarded as lagging behind in this matter, because we are spending within ten years about 9½ crores of rupees on the Sarda canal scheme alone, and that is the most vital scheme at present. The Government cannot tackle other schemes until the Sarda canal begins to bring in revenue.

35,195. *The Chairman*: I think you might tell us definitely whether the formula to which Sir Ganga Ram referred is applied in every case, whether the scheme is protective or productive?—It is only applied in the case of protective schemes. It is only meant to be used in such cases.

35,196. You are familiar with the formula?—Yes. It is one of the appendices in our Irrigation Manual of Orders.

35,197. *Sir Ganga Ram*: Taking a section of the country, say, from your submontane tract right across, what is the fall in the water level?—In the country on the Sarda canal, in the upper reach, the spring level is rarely more than 15 feet below the ground.

35,198. I am afraid I have not made myself quite clear. Supposing you take a line of the levels from the foot of the hills, what is the water slope in the subsoil level?—It is very minute.

35,199. Is it not parallel to the level of the country?—Yes, slightly greater than the fall in the level of the country, so that the fall just under the hills may be, probably, about 15 feet per mile; a little bit further down it varies; for instance, 10 miles further down it will be 4 feet per mile; again, further down it would go down to 2 feet per mile, and here in Lucknow the fall is roughly 6 inches per mile.

35,200. That is the very thing which gives you an indication of the possibility of *karaez* canals?—Just as they have in the North-West Frontier Provinces?

35,201. Yes? And if you dig a tunnel across the water you come to the surface?—It is impracticable in pure sand.

35,202. But there is a possibility of it?—No, the fall in the country is not steep enough; you want very steep country to go in for that.

35,203. If you take the country with a slope of 4 feet per mile where the spring level is 15 feet down, how many miles of tunnel would be necessary to bring the water?—Three miles.

35,204. But it might not be pure sand?—That is what it is in most of the submontane country.

35,205. Have you made any soil survey to show what is the nature of the country?—Only for the Sarda canal.

35,206. The Sarda canal goes parallel to the Himalayas?—Not quite. it is at an angle.

35,207. We have been waiting for your promised note to see how far you have carried out the recommendations of the Irrigation Commission and how far you have not been able to do so?—That was submitted about one month ago to the Secretariat.

35,208. *Mr. Calvert*: Is that the report of the Irrigation Commission of 1901-02?—Yes.

The Chairman: We will come back to that subject towards the end.

35,209. *Sir Ganga Ram*: Can you say how much addition you have made to irrigation since this Irrigation Report was written?—Yes, we have done a tremendous amount since then.

35,210. The Irrigation Report shows that formerly six billion cubic feet were being used, and that Commission have recommended an addition of two billions?—I can tell you from our Administration Report what is the increased area of irrigation since then.

35,211. I want to know how much you have used of nature's gift?—I can get it worked out for you.

35,212. Thank you. You have a certain amount of tank irrigation?—The whole of Bundelkhand irrigation is tank irrigation.

35,213. Do they lift the water by power or are the tanks so situated as to give the water by flow?—It is done by flow.

35,214. Are there many sites on which you can expand that system of tank irrigation?—There is no difficulty of getting flow irrigation in Bundelkhand where the slope of the country is great.

35,215. There must be many places situated on low levels where you can do it?—It is possible in small areas.

35,216. You must get the idea out of your mind that the tank must be situated in such a place where flow irrigation can be done. We have investigated that point in the Punjab because the mere lifting of 8 or 10 feet makes not much difference?—It is done in small areas.

35,217. In your Province lift irrigation has not received the same attention as it has in the Punjab?—Because we go for the flow irrigation when possible and are generally able to give it when necessary. It has now been proved in the Punjab that it is not worth giving flow irrigation to any one because there is very much waste, and you must drive that idea out of your mind.

35,218. In one place you say 50 per cent. is lost by evaporation? Have you studied Kennedy's investigations?—Yes.

35,219. He makes it 25 per cent?—Yes, but he wrote for the Punjab and I also said 50 per cent. because that is the figure in these Provinces to the outlet before water is admitted into the water courses.

35,220. Have you tried to line the canals?—The question of lining canals was taken up very carefully when the Sarda canal project was being prepared; that canal at the head runs through very porous soil and an estimate was got up for lining the main canal and 15 miles of two branches. It was found that the cost of lining would come to three crores of rupees and would not pay.

35,221. Do you know we are following another method now? We are putting a seepage drain parallel to the canal and pumping it up?—That can only be done in the case of stiff soils. We have no water-logging in these Provinces. This was considered in connection with the Sarda canal, and it may be necessary to do this if any sign of water-logging occurs.

35,222. The question of water-logging was fully considered in the case of the Sarda canal?—Yes. As far as we could do so.

35,223. Does any part of it go into embankments?—Yes, considerable reaches are embankments.

35,224. Those are the danger points?—We have been very careful, and on the Sarda canal we have allowed for a mileage of drains equal to half the mileage of distributaries.

35,225. You have not tried puddling?—We have never found puddling very satisfactory.

35,226. On account of the cracks?—Yes.

35,227. On page 19 of the Irrigation Commission's Report, it is stated: "In the alluvial tracts of Northern India, down the line of the Jumna river, the subsoil supply of good water is practically inexhaustible, and its depth generally moderate; the soil and subsoil also generally favour construction. It is difficult, therefore, here to place any limit to the eventual extension of well-irrigation, except the requirements of cultivation." To this remark I want to draw your attention, and I want you to consider the possibility of extending well-irrigation by a compressed air system on the co-operative basis. Will that be possible in these Provinces? You have a series of wells giving water in the case of drought on the co-operative system, without considering whether the water is given to this field or to that field. Will that be accepted by the people here?—The question has never been raised here as yet. I would like to point out that in the matter of canal irrigation this Province has not been backward. We have gone as far ahead as possible since the Report of the Irrigation Commission. Take the Bundelkhand area: everything recommended has been done there since that Report was issued. The Sarda canal was taken up since then.

35,228. You know that a paper was read by Mr. Marsh before the Institution of Civil Engineers about Bundelkhand, and he advocated the system of bunding fields? Has that been done?—An enormous amount has been done. Hundreds of field bunds have been put up.

35,229. In your Province do you insist on not leaving any land without being ploughed, in order to absorb the rainfall? Have you read my article on "Floods and their Root Cause" in the *Indian Engineering*?—I am afraid not.

35,230. What I recommended was that a law should be made that no land should be left unploughed, so that all the gifts of nature are utilised; that will reduce our floods and raise the subsoil water level?—We do not need that in this Province, except in very exceptional cases. The average

spring level in the whole of the Province, except on the banks of rivers, is less than 20 feet, and we do not want to raise it higher.

35,231. That is all the more reason why your well irrigation ought to receive special attention?—Quite; as soon as funds will permit.

35,232. For the proper distribution of water to the zamindars, have you designed any instrument or any other means so as to ensure that water is received at the tail end in sufficient quantities, and that the people at the tail do not suffer?—Distributary outlets of the required size are fixed at a certain depth below the surface, generally 1½ feet below the full supply level, and the number of outlets are only just sufficient to absorb the full discharge.

35,233. Has a module not been found necessary in this Province? You know the A.P.M.? Have you followed that?—We have not found it necessary here; your outlets are very much bigger than ours. In the Punjab you go in up to something like 5 cusecs. Our standard outlet delivers only half a cusec; we rarely give an outlet which takes more than 1 cusec.

35,234. In your Province, do not the tail end people complain at any time that they suffer on account of lack of water?—We do our utmost to see that they do not suffer.

35,235. Have you not got any scientific design which will ensure that they will get a certain amount of water? You might study that question. We have given a lot of attention to it?—We have studied it for the last 50 years. Our system, I hold, is far in advance of the Punjab system. We do not give 5 cusecs to the cultivator to waste. Government looks after the water, and will not hand it over to the cultivator to touch until it is less than 1 cusec.

35,236. What duty do you get for *kharif* and for *rabi*?—It depends on what you call duty. If you take an outlet from a constant channel, we get as much as 300 acres per cusec.

35,237. For instance, if the rice area is 1,000 acres, how much do you allow for that?—We do not allow the people to irrigate more than 45 per cent., or, at the very outside, 50 per cent. of the land.

35,238. Therefore, your irrigation is also partly dependent on wells?—Yes.

35,239. Does that mean that you have no water to give to the whole lot of that land?—No. We could distribute water so as to give it to 75 per cent. or even 80 per cent. of the land, but then we would water-log the land.

35,240. Is that for fear of water-logging?—Yes.

35,241. What do you consider is the safe limit, above which water-logging is dangerous? Simply raising the subsoil water is not dangerous?—No, but if it rises to less than ten feet it will be dangerous.

35,242. Ten feet is the limit?—It is not the limit, but we do not like our subsoil level to rise above ten feet.

35,243. In the investigation of subsoil water-logging, have you found out any point at which the water in the subsoil flows directly towards the river, and does not rise any longer?—All our subsoil water is just the reverse of the Punjab. Yours flows from the river into the centre of the Doab, whereas ours flows from the centre of the Doab into the river. Before we started the Sarda canal, I went up to the Punjab to study the question there. I went over the different canals, as far as I could, and consulted every officer who could give me information on the subject. The Punjab

conditions are utterly different from the conditions in the United Provinces. I think in time the Punjab will have to come to the United Provinces system, and not give water to more than 45 per cent. of the land, as soon as you have filled up your central subsoil basin. You are now giving water to 75 per cent. of your commanded area in many places.

35,244. We do 115 per cent.?—Yes, in many places you do it, but that cannot go on, or you will water-log the country badly.

35,245. *Sir Ganga Ram*: It has been represented to me by landlords here that they would like to have their water extended to a certain extent, because at present they have to depend a good deal on wells. Do you think they are not right in making that demand?—Take, for example, the Ganges—Jumna Doab; all the water at our disposal is being distributed as fairly as possible, but there are many tracts in that where we would like to extend it further.

35,246. But on page 158 of your note you say, "Thus on the Upper Ganges canal only some 1,100,000 acres are irrigated annually out of a gross command of 5,350,000, or 21 per cent."?—That is all. There are large numbers of small tracts which we would like to irrigate, but we have not been able to find water for it from any system.

35,247. You are not starving those people simply because of the fear of water-logging?—No.

35,248. Cannot the water be extended so as to make it available to more than 21 per cent.?—If we had sufficient money to do it, say by pumping from the subsoil back into the canal, we could then extend it. We have not got river water at present.

35,249. That shows that you lose water by seepage?—Yes; I think that is the case with every canal. We do not lose any more here than in the Punjab.

35,250. *Sir Thomas Middleton*: In reading your paragraph on research, it seemed to me that your most important requirement was a skilled and experienced editor of Indian irrigation experience?—Yes.

35,251. That is what you think is the first need in connection with research?—Yes.

35,252. There is a vast amount of information available that has not yet been digested?—Yes, and coilated.

35,253. With respect to the character of the research required for irrigation, there are obviously certain things which could be attempted centrally, such, for example, as the devising of instruments and machinery for measuring and supplying water. But in listening to the interesting examination which has just taken place, it occurs to me that the essential problems of irrigation are local problems?—Yes.

35,254. All the wisdom of the Punjab, for example, would not solve the difficulties of the United Provinces?—No, nor those of the Central Provinces. We are all separate, but still there are general questions which affect us all alike.

35,255. But the essential work must be taken up locally?—I think the essential work should be taken up locally.

35,256. Even within a Province, if you take this one subject which you mention, the question of salt land, that may arise from very different causes, and could not be attacked by an institution which was not in possession of all the local information available?—No.

35,257. Dealing with the question of salt land, I have been asking myself to what extent central assistance could be given to problems of this description, and it occurs to me that there is one type of assistance which might be given: the investigation of salt land might require the assistance of an agriculturist and a chemist, who could be supplied locally?—Yes.

35,258. But it might involve questions requiring a knowledge of soil organisms?—Yes.

35,259. For that purpose it might be necessary to employ a number of specialists, possibly three or four types of specialists who have had special training and experience?—Yes.

35,260. It would help you if from some central source you were able to get such specialist officers to work at a particular problem?—Yes. Of course, when I wrote my note, I wrote it purely from the canal officer's point of view; I was not thinking so much of research with regard to soil analysis and such things as you are referring to now.

35,261. *Sir Henry Lawrence*: To what were you referring?—I was referring to the depth of water that we should give the crops, the methods of distribution and such things.

35,262. *Sir Thomas Middleton*: In another Province we had quite an interesting discussion as to whether the research work in connection with irrigation should in fact be under the Irrigation Department or under the Agricultural Department?—I certainly think all soil investigation should be under the Agricultural Department.

35,263. In this Province you have come to the conclusion that research work on irrigation might easily be separated?—I think the question of water distribution should be left to us, or, at any rate, the engineering side of it; but the Agricultural Department should tell us what depth of water is best for each crop, and the questions of soil analysis should be left to them.

35,264. *Mr. Calvert*: Who would deal with the movements of water in the subsoil?—It is very difficult to say which should take that up. We are confined to those areas of the Province which are already canal irrigated, while their activities extend over the whole Province.

35,265. *Sir Thomas Middleton*: At any rate, in your view it is a subject which would readily lend itself to division between two departments?—Yes.

35,266. And that no such difficulties as were represented to us in the case of another Province need necessarily arise here?—I do not see why they should arise or why we should not collaborate with one another and help one another.

35,267. *Raja Sir Rampat Singh*: You have stated that there are tracts where it is very difficult to build wells because the spring water is too low. Do you take that into consideration in building channels and distributaries with a view to seeing that those tracts where there is scarcity of water are supplied with distributaries, while not supplying distributaries in those tracts where wells can easily be dug?—The only tracts that I know of in this Province where it is very difficult to construct wells are in the rocky hilly country of Bundelkhand and in the submontane district just below the Himalayas where the spring level is so low that it is quite impossible to make wells. Just immediately below the hills every source of water is being tapped at the present time, and cultivation is only possible where that water can be given; that is a very small area. As regards Bundelkhand, we have tackled every big river there and put reservoirs on every big river; that is where our protective irrigation is all situated. I do not know of any other places where the spring level is so low that wells are impossible.

35,268. So no enquiry is made about this matter. I find there are places where wells cannot easily be made because the wells and the lift are too costly, while there are places in the same districts where it is very easy to dig wells and irrigate the fields with well water?—There are certain places, especially in *khadir* lands, where it is very difficult to dig wells, where what in this part of the country is called *kaowar* soil, which is very fine sand, mixed with clay. The result is that there is a very small yield of water, and the people find it very difficult to sink wells in such soil. But I have only seen that in *kharda* lands adjoining rivers; elsewhere they are able to sink wells.

35,269. I have a very small estate on which there are villages where a well costs about Rs.1,000 to construct?—Yes, that is where the spring level is 30 or 40 feet below the ground.

35,270. It is sticky soil which we call *muchalal*?—Yes.

35,271. On account of that we cannot build wells?—Yes.

35,272. So no enquiry is made as to whether certain tracts require more canal-carried water than others?—I think we have investigated the whole Province with a view to introducing canal water. If you could tell me of any tract such as you mention, I should be very glad to have it investigated.

35,273. You stated that in this part of the country fodder is not specially grown in the months January to April; but it is the practice, at least in Oudh, for *khashtkars* to grow fodder crops such as *juar* near their wells long before the ordinary sowing time, simply to supply fodder for their cattle. Is that not the practice where canals exist at present?—To a very small extent. I think, even in Oudh, the percentage of cultivation under such fodder crops is very minute.

35,274. I cannot say it is very extensive?—It may be a field in one village.

35,275. They always sow *gajer* (carrot) for the use of their cattle?—I can say that on the Sarda canal country not one village in ten has one field of *gajer*.

35,276. Do you know what are the average yields per acre of wheat in the Punjab and in the United Provinces?—I am afraid I cannot tell you about the Punjab; in the United Provinces, from irrigated land, I should say it is about 15 to 17 maunds.

35,277. As far as my information goes, the yield in the Punjab is much greater than in the United Provinces?—That I cannot say.

35,278. What is the spring water level in Rae Bareli?—The average spring level is about 32 feet down.

35,279. *Professor Gangulee*: Do I understand correctly that you have no research station at all in connection with the Irrigation Department?—We have no research station.

35,280. In the provincial memorandum you say that this research should be conducted independently and not in co-operation with the Agricultural Department. Do you mean that the engineering aspects of research should be undertaken by you, and that the influence of irrigation on soils and on crops should be undertaken by the Agricultural Department?—I think that would be better.

35,281. You would not call that independently?—I should like both departments to co-operate; they should give us any information they obtain and we should give them any information we obtain. I think they should be responsible, shall I say, for research in such matters as soil and depth of water required by any one crop; we could try then to see how we can give exactly that depth and no more.

35,282. There must be co-operation and co-ordination between the two aspects of irrigation researches?—Yes.

35,283. Have you at the present time any knowledge of the losses due to percolation?—Yes, we have calculated it for a large number of canals; it depends on a very large number of factors; it depends on the depth of the spring level below the canal, the nature of the soil and the wetted perimeter of the canal.

35,284. Is it possible to devise means of passing the water through more quickly so as to reduce the loss?—We have found that if we increase the slope of our canals, the water passing quickly is inclined to carry down the silt instead of letting it pass into the pores of the soil, and we get greater losses; therefore we have flattened our canals in most places where they had excessive slopes; that causes the silt to settle at the bottom; the silt is then, by means of the seepage water, carried into and chokes the pores of the soil, with the result that after a few years the loss is greatly diminished.

35,285. Does the same thing happen in the distributaries?—Yes, we have got very flat slopes in our distributaries.

35,286. I want to ask about the rates, though it is not within our terms of reference. Have you any data as to the amount of canal water required to bring crops to maturity, because I see you base your rates on that?—We base our rates to a large extent on that; but it is, to a certain extent, fortuitous, because a valuable crop such as sugarcane needs more water, and the cultivator is able to pay a higher rate because that crop is more valuable.

35,287. On whose reports do you assess these rates?—The rates have grown up from experience. I think you have got a statement showing what our rates were in the old days; we have gradually found which crops should be encouraged by a lower rate. If we charge a high rate for a particular crop, it may prevent people taking the water, and they may sow other crops. If we find that is so, we lower the rate for that crop. For instance, gram only requires one watering, and a very low rate is charged. There is a higher rate for wheat, which requires more water.

35,288. Supposing I am using your water and I am growing sugarcane; who reports to you that I am growing sugarcane?—We have a revenue staff; from the day the canal is opened that staff goes round village by village writing up every field that is irrigated, the name of the owner and the class of crop.

35,289. When the crop is on the field?—Yes.

35,290. Irrespective of the yield or the profit?—Yes, that we cannot deal with.

35,291. Are these subordinate officials popular with the cultivators, or do you come across cases of cheating, bribery and so on?—There are cases of cheating and bribery, but whenever it is detected the offender is dismissed at once.

35,292. When you spoke of the crop yield as compared with that of America and Egypt, were you thinking of gross value?—Yes, the gross value.

35,293. Who finally pays the owner's rate?—The owner of the land, that is the zamindar, pays the owner's rate.

35,294. I suppose eventually it comes from the tenant?—Yes, undoubtedly.

35,295. In your note you speak of the market value of water; it is not clear to me what you really mean by that?—It is very difficult to describe what is the market value of anything, but I suppose the nearest thing to

the market value of canal water would be what it would cost the cultivator to get his water on the same field from elsewhere; in other words, to raise it from a well; but whether you can describe that as the market value it is rather difficult to say.

35,296. Is there any big scope for irrigation by tanks and bunds in this Province?—We have done a vast amount of that work, and there is still a large scope. Further expansion depends on the money that can be allotted. We have several schemes pending, awaiting the time when funds can be allotted.

35,297. We were told in other Provinces that the average cultivator has a tendency to use more canal water than he actually needs. Do you find that this is also the case in this Province?—That is the tendency here also.

35,298. Is any propaganda done to educate the cultivator on the danger of using excessive water?—We do our utmost to prevent him from doing so, to persuade him to divide his field into *kiaris*, and as I have already explained, we have actually on two occasions instituted fines to force him to do so, but I am afraid it has had very little effect.

35,299. Have you no such thing as Irrigation Panchayats, or some such village organisation through which this propaganda work may be carried on?—No, no regular Irrigation Panchayat.

35,300. Turning to the question of research, you make a reference here to the Agricultural Department carrying out a variety of experiments in the field. Do you know who planned these experiments?—I take it it was the Director of Agriculture.

35,301. These experiments have an important bearing on the problems of irrigation. Were these experiments made in consultation with the Irrigation Department?—I do not know. I was on leave when this memorandum was prepared, but I believe the reference is to experiments done at the agricultural farms.

35,302. Do you know of any experiments being carried out in consultation with the Irrigation Department?—As far as I know, none has been carried out so far.

35,303. When tackling the question of formation of alkali deposits in soil have they never consulted the irrigation officers?—Not that I know of.

35,304. Turning to your precis, you say that modules are unnecessary here. Have you come to this conclusion after definite experiments?—We have experimented with the Kennedy module and we find no better results than our present system, because, as I have explained to Sir Ganga Ram, we hand over such minute quantities to the cultivator that the module is really almost unnecessary.

35,305. On page 157, you have explained what the chief duties of the research officer would be. Have you any idea as to how this object would be attained? You state that the chief duties of the research officer would be to keep in touch with modern irrigation practice, not only in other Provinces, but in other countries?—At the present time a large number of engineering papers are published, especially in America, and papers are written in other Provinces on hydraulics, and other matters in connection with irrigation. But these papers are not circulated; they are retained in their own Province. A research officer would get in touch with other Provinces and collect all such papers into a library where he would collate the material received.

35,306. Would this research officer be under the Central Government?—I think I have explained that in my reply. What we need is a Central Irrigation Congress, which would have its library at Delhi or some other central place. The librarian should be an irrigation officer of experience.

That officer would then collect all the information he can on the question of water-logging, subsoil flow, depth of water used by crops, what is done in America, and 101 other subjects. He should collect all the information he could and collate it in that central library, to which we could have access. When we started the Sarda canal, there was no place to which we could turn to to find out what had been done all over the world on the question of subsoil flow.

35,307. You want an All-India Irrigation Congress?—Yes, a Congress with a library attached, where officers would meet once a year under the direction of the Consulting Engineer to the Government of India, very much on the lines of the Punjab Congress, which has done an enormous amount towards advancing knowledge and science of irrigation and the flow of water. And then I would have research officers in each Province, looking into the questions that affect that particular Province.

35,308. Where are your subordinate officers trained?—Do you mean the revenue officer, or do you mean the engineer officer?

35,309. Both?—The lowest revenue officer is what we call a Patrol. His duties are to patrol the banks of the canal. He also writes up the irrigation as it occurs. We train him ourselves. He rises to the post of *amin*, who is the checking officer who checks the work of the patrol. Over him is the *zilladar*. He has, of course, a large number of *amins* under him. He, again, checks the work of each *amin* and is the revenue officer who prepares the assessment papers under the enginering staff. The engineering staff consists of the Subordinate Engineers who do all the actual construction and repairs. They are trained at Roorkee College to a large extent; as a matter of fact, almost entirely at the Roorkee College. Over them are the provincial service officers, i.e., Assistant Engineers, who also are trained at the Roorkee College.

35,310. Do you consider these *amins* ought to have a certain amount of training in agriculture? Would it be helpful?—There is a certain amount of direct recruitment of *amins* who have superior qualifications in the hope that we may eventually get a better class of *zilladars*. When recruiting these men, those who have passed an agricultural course are considered as most eligible.

35,311. From your note we find that you have come really to the limit of canal irrigation, and now you propose to extend the scope of your irrigation in other directions, e.g., well irrigation. Is that so?—I will not say that we have come to the limit, except where river water is not available.

35,312. As regards the major projects their limit has been reached?—Yes. There is only one more major irrigation project possible in these Provinces, and that is the Lower Sarda canal, which can only be built if the Upper Sarda canal proves a paying proposition.

35,313. Under these circumstances, why would you leave the question of utilising subsoil water to the Agricultural Department?—We only deal with a limited area of these Provinces. We might deal with them inside the canal area, but we have not officers all over the Province, but only where there are canals.

35,314. Is there any conflict from the point of view of revenue? Is there less revenue from well irrigation and more from canals?—There is no revenue from well irrigation at present: it is only from canals. Only private schemes have been taken up in the matter of well irrigation and Government help is given to the landowners.

35,315. Do you think there is much scope for well irrigation?—I think there is enormous scope.

35,316. *Mr. Calvert*: Could you suggest a figure representing the minimum charge per acre irrigated sufficient to cover capital and recurring cost?—Do you mean a pumping scheme?

35,317. No, in your canal area?—It all depends on the cost of the scheme. We do cover the recurring cost except in Bundelkhund.

35,318. What is your minimum rate calculated to cover recurring and capital costs by area irrigated?—You must take up each canal separately. The Eastern Jumna canal pays very well. The Upper Ganges canal also pays, even at the present rate. But they each pay a different percentage, although the rates are the same. It depends on the capital cost.

35,319. I do not want your profits. I want your minimum charge calculated to cover your bare expenses, capital cost *plus* recurring cost?—You must know the capital cost. Capital cost depends on the nature of the canal to be built.

35,320. But for the canals already in existence?—We have numerous canals in existence, and each pays a different percentage with the same irrigation rates.

35,321. *The Chairman*: Can you give Mr. Calvert the figure for the Sarda canal if you have it with you?—You may say it is down to the bare limit; it will just manage to pay its way, and the irrigation rates differ for the different classes of crops. It is Rs.7.8 for sugarcane and Rs.4 for wheat.

35,322. *Mr. Calvert*: What is the minimum basic rate which would cover all capital and recurring expenses?—On the Sarda canal it is about Rs.4-8-0 per acre. After deducting all working expenses that will just about pay the interest charges.

35,323. Interest and all your recurring charges?—Yes.

35,324. That is to say the cost to you of irrigating an acre is Rs.4-8-0?—On the Sarda.

35,325. On the other canals is it similar or lower?—On the Eastern Jumna canal, built at cheaper rates, it is a little lower. On the Agra canal it is about the same.

35,326. Could you suggest a similar corresponding figure for working a well, Rs.20 an acre?—I think it is a little less than that; there again I am afraid it is only a guess.

35,327. What will be your minimum and your maximum for your water rate?—Rs.10 to Rs.15 an acre; but that is only guess work and would depend on the capital cost and nature of the scheme.

35,328. The actual assessment of your rate is done by your department?—Yes.

35,329. If that were transferred entirely from your hands to the Revenue Department, would you expect a loss of revenue?—I do not see why there should be exactly a loss of revenue.

35,330. The Revenue Department will get as big an assessment as your Canal Department?—We supply the water, write up the area and make the assessment; they do the collection of the money. If they were to write up the area also it might go down slightly, but I could not give a definite opinion.

35,331. Do you think it might go down sufficiently to change the classification of the work from productive to unproductive?—No, I do not think so unless the margin is very small.

35,332. Has any experiment actually been made in volumetric delivery of water?—None.

35,333. Does your department take any active measures to encourage the growth of sugarcane in preference to other crops?—No; it has increased of itself very amazingly of late years. Taking the Sarda canal area, Sir James MacKenna asked me the area under sugarcane when he presided over the Sugar Committee in 1918; the figure then given was 91,000 acres and at present though it is grown without the help of the Sarda canal water the figure according to the last year's crop report is 261,000 acres.

35,334. *Sir Ganga Ram*: Does that not show that the canal is not wanted?—That is a matter of opinion.

35,335. You say that you want five waterings for sugarcane over and above the rainfall?—Yes.

35,336. Supposing there is no rainfall, how much water do you require?—That I cannot say; such a thing has never occurred.

35,337. In certain Provinces I was told they give 140 inches of water for paddy. You cannot say how many waterings sugarcane would require if there is no rainfall?—The rainfall is 30 inches, and I take it we have to replace a large proportion of that rainfall.

35,338. Could you give us any information about paddy? I suppose it is not grown under canal irrigation in this Province?—Yes, a considerable area is grown.

35,339. Over and above the rainfall, how many waterings do you give?—Sometimes three waterings; it depends on the nature of the crop.

35,340. Have you any definite information about the line of wells below which you could not go?—You mean the greatest depression head? It depends on the nature of the sand.

35,341. If it is a good *mote*, up to what depth can they go?—I am afraid I cannot tell you; it varies so much.

35,342. Do you employ *zilladars* from the Agricultural College?—No; *amins* are appointed direct from the Agricultural College.

35,343. *The Chairman*: Over how many years do you spread your repayments for capital charges in the case of schemes called unproductive? What is the basis of amortisation?—I should not like to answer that question; the Finance Department deals with it; it has nothing to do with the Irrigation Branch at all. I believe in the case of the Sarda canal it is fixed for 80 years. Protective works have in the past been financed from funds given by the Government of India out of savings. The Sarda canal, as far as I know, is the only canal in this Province for which there is a sinking fund

(The witness withdrew.)

Lt.-Col. C. L. DUNN, D.P.H., I.M.S., Director of Public Health, United Provinces.

Note on the effect of Ill Health on the Agricultural Population.

1. *Relation of health to efficiency.*—*Mens sana in corpore sano* is a very well-known adage and epitomises the relation between health and efficiency. Ill health in all occupations is detrimental to efficiency so that there is a constant necessity to endeavour to reduce ill health to a minimum, before increased efficiency can be expected from the agricultural population.

2. *Chief causes of ill health.*—In the United Provinces, the chief causes of ill health are malaria, cholera, plague, small pox and other infectious diseases and the respiratory and intestinal diseases, but the great cause of ill health and therefore lowered output is undoubtedly malaria. Diseases such as cholera, plague and small pox are short in duration, and either result rapidly in death or recovery, and therefore have not got a very great effect on the output of the agricultural population. A high death-rate in a country does not necessarily react detrimentally on the efficiency of the workers in that country as long as the death-rate is not higher than the birth-rate. In the United Provinces the death-rate is on the average 2½ times as high as it is in the United Kingdom, but as the average excess of the birth-rate over the death-rate is about six per mille, there is a natural increase in the population higher than in most western nations. There is, therefore, little, if any, shortage of labour in any of the districts of these Provinces. It is consistent ill health and the debility which arises therefrom that has the chief detrimental effect on the agricultural population, and malaria is the chief cause of chronic ill health and debility. There are also other causes of a minor character, such as tuberculosis amongst the respiratory diseases, dysentery and hookworm disease among the intestinal diseases, and I propose to confine my remarks chiefly to these important causes of ill health.

3. *Debility due to malaria.*—Malaria is prevalent all over the United Provinces, but in certain districts is very much worse than in others. According to the official returns nearly one million people die of malaria in the United Provinces every year, but these returns are exceedingly inaccurate, owing to the fact that the reporting agency in rural areas is the illiterate and usually ignorant village *chaukidar*. I have examined this question with care for the last five years, and by comparing the causes of death as checked by professional agency with the official agency, I find that it is probable that the actual deaths from malaria are under 100,000 per annum and that a large number of deaths which are attributed to malaria are really deaths from pneumonia, enteric fever, relapsing fever, dysentery and other diseases. There is no doubt, however, that most of these returned as dying from malaria were suffering from malaria or were debilitated from the effects of malaria. Malaria, therefore, is a great predisposing cause of death.

In a note to Government on the requirements of quinine of the United Provinces, I made a very conservative estimate that at least one-quarter of the population of the United Provinces had at least two attacks of malaria per annum, and that the percentage of people in which these attacks were properly treated by quinine was under 1 per cent. The result of this is that 25 per cent. of the population must have been incapacitated from work for at least two months of the year, besides having a lowered vitality for the rest of the year. The agricultural population of the

United Provinces is about 34,000,000, and of that 34,000,000 the adult population, both male and female, who work in the fields must be at least 18,000,000, and I calculate the loss of efficiency of these 18,000,000 owing to debility as at least 50 per cent. of their possible output.

There is little doubt that, if quinine in sufficient quantity were available in every village to treat all attacks of malaria, a great deal of this debility could be done away with. In 1921, the total supply of quinine available for all India was only about 160,000 pounds owing to the great shortage in the world supply, whereas in order to give each person who gets an attack of malaria in the United Provinces anything like an efficient quinine treatment, double this quantity would be required for the United Provinces alone. The chief requirement, therefore, at present, in the United Provinces is a very largely increased supply of quinine. It is also necessary that there should be, as well as an increased supply, a considerable reduction in the present price, which puts quinine beyond the pocket of the poorer classes. There is no doubt that were cheap quinine available in large quantities, it would be extensively used in every village, as the agricultural population are, for the most part, thoroughly aware of its value.

In addition to increasing the supply of quinine, much can be done by Government to reduce the incidence of malaria, but I am afraid that the cost of widespread anti-malarial measures in rural areas will be for a long time prohibitive, and therefore not practically possible. It is possible, however, to reduce the incidence of malaria by drainage, &c., in certain rural areas where the agricultural value of the land is high as well as the incidence of the disease, and it should be the policy of the Government, when funds are available, to gradually increase their grants for the purpose of undertaking anti-malarial measures of a permanent nature. There are other areas, such as certain tracts along the foot-hills of the Himalayas, where the cost of rendering these areas non-malarious would be so high as to render it economically impossible to produce good results. These areas should be evacuated and the land given back to the Forest Department. Major Phillips, Assistant Director of Public Health, Malariology, has submitted a full report to Government on this subject with regard to the Bhabar and Terai Estates, and has recommended that certain tracts be evacuated, where the death-rate has always exceeded the birth-rate, and probably always will.

4. *Tuberculosis.*—With regard to tuberculosis, which is fairly widespread in the United Provinces, but chiefly in municipal areas, the only thing that can be done is by education and propaganda to create a demand for better housing conditions. The chief predisposing cause in tuberculosis, as in all respiratory diseases, is overcrowding. For various reasons, climatic and otherwise, the people of India, during certain months of year, have the habit of living in small, dark and ill-ventilated rooms, with the result that during such seasons of the year, viz., the three coldest winter months and the three months of the monsoon, the incidence of respiratory disease is very high.

5. *Dysentery.*—With regard to dysentery, this disease is responsible for a great deal of morbidity in villages, and the chief causes are (*a*) impure village water-supply from shallow wells, and (*b*) faulty methods of storing manure, thus encouraging the breeding of large numbers of flies which carry the disease from infected excrement to the food of the people. The first of these causes, i.e., impure water-supply, is the chief cause in India of all infectious intestinal diseases. The average village well is badly constructed and faulty in site and thus is being continually polluted by the subsoil water, so a reasonably pure water-supply cannot be expected unless

a very large amount of money is available. In certain large villages under the Village Sanitation Act, a certain amount of money from Government grants and from very small local taxes is available for this purpose; in such villages certain improvements are noticeable, but these villages contain a very small percentage of the total rural population. In other villages there is no local taxation, and therefore no funds are available to keep the village wells in proper order. Small grants made by the Board of Public Health for this purpose only affect an infinitesimal proportion of the villages, and it would require a very large sum of money to provide all villages with properly constructed wells. I do not see how it will ever be economically possible to supply these wells unless the villagers are prepared to be taxed in order that the necessary funds may become available. Apart from the initial expenditure required in most villages, the sums necessary for upkeep of the wells in each village would be exceedingly small and their provision is economically practicable.

6. *Hookworm.*—Hookworm is exceedingly prevalent all over the United Provinces. It is a chronic disease which causes anæmia and therefore debility in the infected individual to a greater or less extent. A report on the prevalence of hookworm in the United Provinces was submitted to Government in 1919 by my predecessor. As the result of the investigation undertaken, it was found that in eastern districts 86 per cent. of the population were infected and that the percentage infected gradually decreased in proceeding towards the west until the lowest infection was found in the Jhansi district. The reason for this is as follows:—

The eggs of the hookworm are voided by infected persons in the fæces, and as it is the common practice in all villages to use the fields for attending to the purposes of nature, these eggs are found in the ground. As nightsoil is also used as manure in the fields, agricultural land becomes infected and the young worms which are developed from the eggs find their way into human beings through the pores of the skin of the feet and developed into the adult worms in the intestine, thus continuing the life cycle. As the majority of agricultural labourers go barefoot they have no protection against being infected. In the eastern districts where the climate is damper than the western districts, these worms and eggs can exist for long periods in the ground, while in the western districts, owing to the drier climate, they are desiccated and die, and this accounts for the geographical distribution. The hookworms in the human body can be easily killed by thymol, but in order to sterilise the whole of the infected agricultural population, an enormous amount of thymol would be required. Even if this were carried out, the result could only be of a temporary nature as long as the people continue to work barefoot in the fields. It would not be possible to ensure the complete sterilisation of the whole rural population, so that the fields would again gradually become infected, and after a short period the percentage of infected persons would be again as high as ever. I, therefore, advised Government in 1921 that it would not be practicable to do anything effective to reduce hookworm in rural areas, but that it was quite possible and practicable in industrial areas.

7. *Organisation for measures of relief.*—No measures for ameliorating the health of the rural population can however be carried out with any success until a complete and adequate public health service is provided. Until the last few years, apart from the Director of Public Health, four Assistant Directors for general duty, and one for malaria work, there was no whole time public health personnel at all in the rural areas of these Provinces with the exception of the vaccination establishment and public health work was supposed to be carried out by the District Officers on the advice of the Civil Surgeons. Shortly after taking over my appointment in 1919, I impressed upon Government the necessity of establishing a Public Health Service for

rural areas, as it was quite impossible for the Civil Surgeon with his multifarious duties at the headquarters of the district to be able to advise and control all the necessary public health activities required to make the least impression on the great mortality and morbidity which prevails in all districts in these Provinces. Government accepted my views and during the last five years, as far as funds permitted, they have sanctioned district establishments of public health officials consisting of the skeleton organisation of a District Medical Officer of Health, and Assistant District Medical Officer of Health and one Sanitary Inspector per tahsil, together with various other public health officials in charge of public health travelling dispensaries and on special public health duty. Seventeen districts have now been staffed with this skeleton organisation, and with practically no exceptions, the Chairmen of District Boards and District Magistrates have eulogised the work of these officials, and there is no doubt whatever that they have been responsible for largely reducing mortality and morbidity. These officials are whole-time officers, and are on tour for the greater part of each month in the villages advising and controlling sanitation and prevention of disease.

An important part of their work has also been the work of educating the people in the methods of escaping the various prevalent diseases. For this purpose a permanent Hygiene Publicity Bureau has been established with the sanction of Government with a staff of two whole-time medical officers of health. The Bureau prepares simple lessons and stories on a large number of subjects connected with sanitation and prevention of disease. These stories and lessons are illustrated by large coloured posters and by sets of magic lantern slides. These posters, lessons and magic lanterns, together with sets of slides, are distributed to all Medical Officers of Health in towns and districts and in the travelling dispensaries, in order that they may be adequately supplied with suitable material for their propaganda work. A cinema and many films of public health subjects have been obtained recently, and exhibitions will be given at large religious and other gatherings at which the rural population congregate.

In order to further assist in propaganda work by illustrating bad and good sanitation and the prevention of disease under Indian conditions, a cinema camera has been obtained and arrangements are in train to take films in India for exhibition. This propaganda work is gradually being extended and developed with a view to creating a demand in the rural population for better conditions. I am firmly of the opinion, however, that the Department of Education should give much more assistance than they do at present to the cause of educating the people in hygiene, and I have on various occasions pressed Government to make the teaching of hygiene in all schools compulsory. Up to date, however, I understand that such teaching is only compulsory in the normal schools and not in the high, middle and primary schools in the Province.

It is the policy of Government to extend this organisation to every district in the Province as funds and properly trained personnel become available. The skeleton personnel sanctioned at present is merely a beginning, and it is hoped that the policy of Government will be to gradually extend the scheme until there is an adequate number of properly trained public health officials available for every tahsil and *pargana* in the Province. It is also essential that the whole of the superior public health personnel working in these Provinces should be organised and controlled by the provincial department, as in public health such important matters cannot be left to the vagaries of local bodies.

It is hoped that the whole of the rural areas in the Province will eventually be divided into compact areas in each of which there is a fixed dispensary for the cure of the disease and public health personnel for the prevention

of disease. This system would do away with the necessity for travelling dispensaries which at present endeavour to cope with the absence of the properly equipped fixed dispensaries in many large areas in these Provinces. The provision of a fully equipped and fully trained organisation of this nature would enable the Public Health Department by propaganda, precept and example to create a demand among the rural population for better conditions of living and for many measures for the prevention of debilitating diseases being introduced, and I have also little doubt that in time their objections to increased taxation, in order that funds ear-marked for this purpose may be available, will come to an end. With such an organisation, the wide distribution of quinine for the treatment of malaria would be possible, anti-malarial schemes in suitable areas could be carried out, better housing conditions in villages for the prevention of tuberculosis could be provided, improved village wells could be constructed and better methods of storing manure could be taught to the villagers.

8. *Milk.*—In addition to the above causes of debility among adults, one of the great causes of death, illness and debility among children, which has undoubtedly a permanent effect on their physique through life, is the faulty and inadequate milk supply available both in towns and villages. This is a very important question, which under present conditions in India is difficult to solve. In my opinion, many years of propaganda work and education will be required before a demand for a pure milk supply is created. When created, one of the first steps to be taken will be for Government to try to improve the breed of cattle all over these Provinces. At present a large number of buffaloes and cows are kept in most villages, the great majority of which only produce an average of three to five seers of milk per day. These also are in such numbers that it is only in exceptional years that they can be adequately fed throughout the year, with the result that the villagers are impoverished by the amount of the fodder which these animals eat, and as this fodder as above stated is usually insufficient, the economic value both from the milk point of view and from their capacity for work is very low. In other words, under present conditions, the majority of the cattle in India are not worth their food. If, by the introduction of high class pedigree stock from other countries, the breed is improved, the capacity for work of the village cattle would be doubled and even trebled, and the number necessary to be maintained would be half or less than half the present numbers. This would result in there being an adequate supply of fodder for all necessary animals. The milk supply would be far greater than at present and more nutritious.

The next step necessary would be to educate the people in the cleanly collection and distribution of milk. At present all castes in India boil their milk before taking it and thus escape many of the milk-borne infectious diseases, so that this social habit is in a way hygienic. This is true, however, only as regards the adult population, as such milk, which has been boiled before the consumption is not a proper food for children. By boiling, the vitamines of the milk are destroyed, with the result that children fed solely on such milk, owing to the absence of the essential vitamines, become debilitated and ill nourished and develop diseases which often incapacitate them from full work throughout their whole lives.

9. To summarise the methods of increasing the output of the agricultural population from the public health point of view, we must have

(*a*) an organised and educated public health service in all rural areas in these Provinces,

(*b*) a central organisation to control the whole department and supply this personnel with all necessary educative and other material,

(*c*) money to carry out all necessary works for the amelioration of village conditions.

The framework of the first two is in existence and only requires expansion, the third requirement is however being supplied at present in quite inadequate amounts, and until the amount of money available for public health is greatly increased little can be done.

Oral Evidence.

35,344. *The Chairman*: Colonel Dunn, you are Director of Public Health in the United Provinces?—Yes.

35,345. You have provided the Commission with a note of the evidence which you wish to give. Is there any statement of a general character that you want to make at this stage in amplification of that?—No.

35,346. You have given us a very clear outline of your views on some of the important problems coming within your responsibility. Have you attempted at all to assess the probable cost of some of these in relation to the financial possibilities of the immediate future?—With regard to the items in which I say that public health personnel must be widely distributed in all the districts in the Province, I can give you practically the exact figures.

35,347. Would you send those in*?—Yes.

35,348. I will take it it would be very difficult to assess the probable cost of an anti-malarial campaign on a large scale in the rural areas?—Very difficult indeed, but I can give you one or two cases of recent surveys in the rural areas. We have just finished one three months ago in a very intensively malarious town, Phulpur in the Allahabad district, with a population of about 6,000. We found that, owing to the large numbers of tanks and depressions and to the high subsoil water, drainage was extremely difficult, and the estimate of the Engineering Branch of the Public Health Department was about Rs.1,20,000 to fill up the drains and depressions indicated by the malarial survey. That was to the benefit of a population of 6,000, so when I received the estimate of the Engineering Branch I sent it on to the Government, and said that I considered it was economically unsound to spend such a large sum of money to benefit such a small population. An estimate for the same work in the town of Bareilly with a population of a lakh was about the same figure, and I recommended that we had better spend the amount of Rs.1,20,000 on Bareilly instead of on Phulpur.

35,349. I take it there is a certain recurring charge to be expected in the case of all these schemes over a series of years?—It is a much bigger question than that. I pointed out to the Government that at the present time it should be the policy of the Government to undertake such anti-malarial work as the finances of the Province permit. I pointed out that in a flat country like the United Provinces a great deal of filling in of depressions and hollows was needed; but even if works were carried out the villages were not likely to keep them up in the slightest degree, so that the same conditions were likely to occur in the near future owing to the social habits of the people. When they build a house they dig a hole to get the earth, and when they repair the house after the monsoon they do the same. I put the whole thing up to the Government, showing that rules and regulations should certainly be drawn up in every village or rural area in which we do any work; otherwise the whole of the money would be wasted.

35,350. Have you any views as to how the supply of quinine for India might be increased?—I believe there are certain areas that have been surveyed by the cinchona-growing experts. These areas are available in Madras, in the lower parts of Bengal, and in Burma, where there are very large areas indeed at present not used for any other purpose, but which could be used for the growing of cinchona.

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* Not printed.

35,351. It is a substance which can only be produced in certain Provinces but is required by all the Provinces? Would you regard that as a good argument for placing the development of the quinine supply in the hands of the Government of India?—I think quinine supply should be altogether in the hands of the Government of India.

35,352. You have, I think, no Public Health Act in this Province?—No; we have a series of Acts which I have proposed to Government should be amalgamated into one Provincial Public Health Act. I consider that the first essential is a Public Health Act for all India.

35,353. I was coming to that. Have you advocated that publicly?—Yes, to my Government. I have also explained my views at conferences which have been held at various times at Simla and Delhi, and I know that one of the Public Health Commissioners to the Government of India, Major-General Hutchinson, who is now in Madras, drafted a Public Health Act, but the Government of India did not take it up. This view of mine was also shared by all the Directors of Public Health at the Public Health Conference held, I think, at Simla in May, 1919.

35,354. *Professor Gangulee*: And the Government of India gave no reasons for not accepting that Act?—I have no information. I was merely informed privately by Major-General Hutchinson that it was rejected.

35,355. *The Chairman*: I gather from your notes that you think the Education Department might be useful in spreading a knowledge of hygiene amongst the population? Are there any primers on health in use in the primary schools?—No, we have prepared several in my department and others have been prepared by other people, and these have been approved by my department. They are used as English readers, but not, as far as I know, in primary schools.

35,356. Do you think there is any scope in the primary schools for the teaching of simple health rules?—Yes, I think there is great scope.

35,357. Have you put that forward?—Yes.

35,358. Has it occurred to you that the co-operative organisation as it expands and becomes more vigorous might be a useful engine of propaganda in matters of public health?—Yes, it might be.

34,359. *The Raja of Parlakimedi*: Will you please tell me what is actually being done for child welfare in the United Provinces?—We have not come down to an absolutely standard policy yet, but the policy which I proposed to Government some time ago and which has been tentatively accepted is that all local bodies should be assisted financially and by technical advice to the greatest extent possible. Very few centres were in existence in the United Provinces up till about four years ago and any that were depended on the presence of some individual person who might be called a "live wire" and who kept it alive by raising subscriptions and getting money and starting new centres. I have found by experience that this enthusiasm disappeared as soon as the energetic person, the "live wire" withdrew. I have been trying to get a more standardised system of child welfare centres no longer relying on the energy and philanthropy of a single person, by starting more or less standardised committees in each of the large towns by virtue of the position of the person, such as the scheme that we started in Lucknow two years ago in which the Government through the agency of the Lady Chelmsford League promised a subscription of Rs.10,000 annually provided that the Municipal Board would put up a similar amount and provided also that the All-India Red Cross Society, United Provinces Branch did the same, and that the committees should consist of representatives of those that supplied the funds: in other words, that the Municipality would have, say, two members on the committee, the Lady Chelmsford League would have two members, the Red Cross would have two,

the general public would nominate two, the lady doctors in the town would nominate two and the treasurer should be the Executive Officer of the Municipal Board, while the secretary would be the Medical Officer of Health. This scheme was completely accepted and is running, and there are now five centres in Lucknow under a trained lady doctor who is in executive charge with a midwife attached to each centre and health visitors attending the centres. The scheme has now been copied by Cawnpore with certain modifications to suit local conditions, one of the subscribing bodies being the Associated Mills. I have just come back from Allahabad where they have agreed to a similar scheme, the only difference being that the Municipal Board demanded a bigger representation than we thought was commensurate with the amount of funds they supplied. The scheme is running in Bareilly on the same lines, and it is to be started in Benares. There are other small schemes which are still run on the old "live-wire" system at places like Agra, Muttra, Pilibhit, and so on, but they have not yet been organised on permanent lines. I do think that we are making an advance. I do not want complete standardisation, but I want continuity so that centres may go on functioning in spite of somebody being transferred or dying. The policy of the Government is to assist to the greatest possible extent, and more money has been asked for in this year's budget in order to extend to further centres, but the money must come partly from the Government, partly from the Municipal Board or District Board and the remainder from charitable organisations like the All-India Red Cross Society. As far as the Lady Chelmsford League in the United Provinces is concerned, it is merely a sort of disbursing agency. The money does not come from the Government of India or from the Lady Chelmsford League at all; it is simply voted by the Council and the local branch of the Lady Chelmsford League is used as their disbursing agency.

35,360. Do you maintain statistics of incomers in those baby centres?—Yes, they are published in my annual report every year.

35,361. And on that Board or advisory committee are you having any low-class people, people from the poor quarters, to see that these things are carried on efficiently? Actually the poorest or what we call the depressed classes get the full benefit of it?—The centre in Bareilly is now actually attending to nearly half of the children born there every year. In Allahabad also the conditions are similar. Practically all of the people attended to are of the poor class.

35,362. It is of course run on cosmopolitan lines?—Absolutely. The only thing is that some of the rich people who subscribe think that they ought to have their children attended free as well.

35,363. As regards the milk supply, do you see to that also?—Yes, the milk supply in the centres is above suspicion.

35,364. What are the sources of this milk supply?—The sources are many and diverse. I think I have mentioned the fact that there is one thing which saves the people, and it is the fact that they boil the milk. I think every caste in India boils the milk.

35,365. The people fear buffalo milk and therefore precautions would have to be taken to see that only cow's milk is supplied?—Buffalo milk is perfectly good milk. Of course it is not given to very young children because it is very strong, but it can be diluted with water and then given.

35,366. As regards midwifery, what assistance do the public get? Is there any organisation for this also?—Midwives are engaged by the centres and there is a Lady Medical Officer who is in charge of the whole organisation, each centre being supervised by her. She is the inspecting, controlling and consulting officer for both midwifery and health visiting.

35,367. Is it your opinion that this work is getting more and more popular with the different local bodies in the Province?—Child welfare undoubtedly is getting more popular; the people are only too willing to take advantage of these centres. The new centre opened in Agra in January has had an attendance of 250 daily already.

35,368. Do you think that in course of time the whole Province will benefit by this?—I think so; but I am afraid the initiative must come from the Government at present. As time goes on the local bodies will take more and more interest in it. In Bareilly, for instance, to begin with, the Local Board would not subscribe anything; then they began by saying they would give Rs.500, and now their subscription has risen to Rs.1500, and for the following year they have, I believe, budgeted for Rs.3000.

35,369. What precautions are taken to assure village sanitation?—None. We cannot assure village sanitation.

35,370. Are not Municipalities and Local Boards taking any interest in that matter?—The Municipalities have nothing to do with village sanitation.

35,371. In Madras the municipal areas are spread over three or four miles, and there are people living just on the outskirts of those areas?—I see what you mean. We call these the suburbs, or *purwas* as they are known here. They are on the outskirts of the Municipalities. They pay the taxes if they come within the municipal limits, but I am afraid that they do not derive very much benefit from that. You have only to go round the outskirts of the big cities and you will find these areas very much neglected. They practically live under village conditions, as they do not get any lights or drains or things like that. I have brought this to notice in my inspection reports, but many Municipal Boards take no notice of that. You find the very same thing here in Lucknow. If you just go round the outskirts you will find that the people living round the outskirts do not derive any benefit whatever, at any rate not to the extent that they should.

34,372. The general condition is deplorable?—Yes.

35,373. *Sir James MacKenna*: Have you any Public Health Institute in this Province?—It is rising above the ground now. The foundations were laid about October. I started agitating for this in the year 1919 and the Hon'ble Minister persuaded the Council to give me the money for it last year.

35,374. Have you any officers of the Medical Research Fund working in the Province?—There are three.

35,375. What are they doing?—One is doing cholera research, one is on plague research. All three are Rockefeller Foundation scholars who went to America under the ægis of the Rockefeller Foundation and the majority of the expenses are being found by the Indian Research Fund Association. The other one is now in the regular line.

35,376. Where do they work?—There is a temporary building just about 300 yards from here in which they are working now.

35,377. How many Sanitary Engineers have you?—There is the Superintending Engineer, Public Health Department, and I think he has got four Executive Engineers under him.

35,378. Do you not think that it is rather an expensive luxury, I do not mean these officers' pay, but the schemes are apt to be very expensive from the Public Works Department and medical point of view?—I am allowed to go over the estimates from the sanitary point of view, but from the engineering point of view I cannot say anything.

35,379. This note* on malaria by Dr. Banerji left me with the question in my mind as to whether it is better that the population should die of starvation and thirst than of malaria?—Neither is necessary.

* See pages 195-202.

35,380. Where is Dr. Banerjee?—He is at present in America. He has also got a Rockefeller Foundation scholarship.

35,381. *Professor Gangulee*: What are the researches in which these men are engaged now?—Dr. Goyle is carrying out research with a view to endeavouring to find out a little more about the epidemiology of plague, beginning where the Plague Commission left off, and up to date we have carried out a complete seasonal and geographical distribution of all the rats and rat fleas of the United Provinces, which is a very complete work. We are endeavouring to find out whether the prevalence of certain rat fleas has any influence on the incidence of plague, either epidemic or endemic. It has been held by some authorities, notably the late Major Cragg of the Indian Medical Service and Dr. Hirst who is Bacteriologist to the Colombo Municipality, that a certain flea which was supposed to be a carrier of plague to a great extent was not so; but as far as we have gone, everything we have found out at present goes to prove that Major Cragg and Dr. Hirst are both wrong as far as this Province is concerned. This might be considered by you to be rather an academic research, but it is the foundation for carrying on future research.

35,382. Are you doing any research on diet?—Not any in this Province. We are relying on Colonel McCarrison.

35,383. You are in touch with him?—I hope to meet him every year, and I read his papers.

35,384. You have made a beginning with a public health service for rural areas, and you mention something about a skeleton organisation. Can you amplify your idea of such an organisation?—We have got a public health service in 17 districts out of 48.

35,385. What is the nature of that organisation?—The organisation consists of adding a District Medical Officer of Health to each district, and, according to the size of the district, one, two or three Assistant Medical Officers of Health, together with a Sanitary Inspector to each *tahsil*.

35,386. Are these Sanitary Inspectors trained?—Yes.

35,387. Are the Medical Officers graduates from the Lucknow Medical College?—They are more than that; they hold diplomas in public health.

35,388. What is the attitude of the local bodies to these organisations?—At first suspicious, now enthusiastic without exception; and the attitude of the District Magistrates and Commissioners is equally favourable. They have said that they were somewhat sceptical at first, but even the most sceptical have given in and admitted that the work that is being done has been of great benefit in the rural areas, especially in the nipping of epidemics in the bud before they have spread.

35,389. You have a Village Sanitation Act here?—Yes.

35,390. Is it functioning?—It is applied to certain villages.

35,391. How is that?—I have forgotten the exact reading of the Act, but I think that to villages with a population of over 2,000 the Act is applied on the advice of the District Magistrate, after he has consulted the people, and they are willing to come under the Act.

35,392. You talk about a proposal for a permanent Hygiene Publicity Bureau. Has it been established?—It has, and has been sanctioned as permanent by Government.

35,393. Do you get any assistance from non-official agencies in these matters of health propaganda?—We have *Seva Samithis*, and they are of help, especially in the large religious *melas*, but I find that they are like what I said about the child welfare enthusiasts. It is a matter of the personal factor, not the settled policy of a body. It is a matter of

somebody with a personal interest; when there is such a man the *Seva Samihis* becomes energetic, otherwise it fades away and drops the subject.

35,394. What is your organisation for collecting vital statistics?—It is exceedingly bad; in the Municipalities it is all right, but in the villages it depends on the village *chaukidar*.

35,395. Have you any scheme for subsidising medical practitioners in rural areas?—Yes. It is not under my control, but I know of it. It is under the Inspector General of Civil Hospitals. Up to date, I am given to understand, the response has not been very good, and in spite of the subsidy it is very difficult to get medical graduates to go and practise in rural areas.

35,396. Do you associate malaria with irrigation?—Very much so.

35,397. That has been your experience here?—Very much so.

35,398. And with defective embankments?—Undoubtedly, chiefly from seepage, and, in the past (I do not say now), by canals sometimes crossing the natural lines of drainage without sufficient syphonage under the canals to allow natural lines of drainage to flow. In the case of the Sarda canal, that has been gone into very carefully indeed, and I think there will be no holding up of the natural lines of drainage of the country at all by the Sarda canal. The Department of Public Health was very carefully consulted on the whole matter.

35,399. In the note by Dr. Banerji which has been submitted to us, one of the measures which he suggests is a survey of existing embankments. It occurs to me that, supposing you do make a survey of the existing embankments, can you possibly remedy the evil already done?—Yes, I think in many cases it has been done. For example, the banks of the canal at Roorkee have for miles together been made of *pucca* concrete, simply to prevent seepage, and in one or two other malarious places the Canal Department have made the banks of the canal *pucca* to meet our views.

35,400. As regards malaria, I think mere distribution of quinine will not solve the problem; what is your view?—I am inclined to think that there is a great deal in the distribution of quinine. I would not like to dogmatise on it, but I think that, if quinine were available in the Province for every person who has got an attack of malaria and that person took it, malaria in these Provinces could be reduced by 60 to 70 per cent. in three years, because it is perfectly obvious that the reservoir of malaria is the human being, and, if you reduce the amount of parasites in his peripheral blood, the mosquitoes will become far less infective.

35,401. You talk about a central organisation to control the whole department and supply its personnel with all necessary educative and other material. What would be the nature of this organisation?—Public health is not a provincial matter, it is not a local matter; it is a matter of Imperial and international importance. My own private opinion is that, at the present moment, the local bodies are given far too much scope; in other words, they are not required to do certain essentials. I mean by local bodies the Provincial Governments, Municipalities and District Boards. There are too many permissive clauses in the present rules, and I would like to see a lot of the present rules altered. I have submitted proposals to Government on this point, and I must say that they have been received in a very good spirit. Government, as far as I am concerned, are in agreement, and it is only a matter of policy as to when a little strengthening of the Acts will be taken up. I think that there should be a Public Health Act for the whole of India, enjoining certain things on the Provinces as well, in order that public health may be treated from an Imperial standpoint, and in order that there may be co-operation and co-ordination.

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* See Appendix, page 202.

There should be certain minima which must be carried out by each Province and, *ipso facto*, by each District Board and by each Municipality.

35,402. You would have an All-India Public Health Act and also a central organisation?—Yes. I think that in public health, the control of the Government of India as to certain essential minima should be greater than it is now. The control of the Provincial Governments over local bodies should be very much greater than the control we now have over the local bodies here.

35,403. With a central organisation like that, would you be able to co-ordinate the activities of all the Provinces in matters of public health?—Yes.

35,404. *Mr. Calvert*: Have your district health staff any powers to enforce their advice in villages?—The only power they have is voluntarily delegated to them by the Boards. Government have circulated every Board, on my advice, certain powers which they say should be delegated, both in cities and towns. As far as the cities are concerned, I am glad to say that practically every single one of them has followed up the advice of Government, and have delegated those powers. With regard to District Boards, the District Board Act has not been in force long enough yet, and the regulations and by-laws which are supposed to be made under many sections have not yet been made; but up to the extent possible I may say that the District Boards have delegated and do delegate the powers.

35,405. From your note, am I correct in gathering that you rely more on educating the people than on these powers?—Yes, at present, under the present rules. I would like to have the by-laws strengthened, but at present we have none in District Boards. We have to do our best by propaganda.

35,406. On the difficult and delicate question of expenditure on the prevention of disease and the cure of disease, are you satisfied with the present ratio?—No, certainly not.

35,407. You think that the public at large would gain better by a re-arrangement in your favour?—Certainly.

35,408. In this note on malaria, mention is made about paddy fields. We have had evidence that the malaria mosquitoes do not breed in the paddy fields?—They do not breed in some paddy fields. I shall give one example. Malaria mosquitoes do not breed where the soil is peaty. If there are peaty acids in the soil, no self-respecting anopheles mosquito will breed in it; the mosquitoes that breed there will be non-malarial. If there is alkali without any trace of peaty acids or vegetable acids formed from highly organic moulds, or if there is a lot of manure on the fields, the mosquito does not breed in the paddy fields; but if there is an alkaline soil and also low-lying areas filled with water, they do breed. For instance, in Saharanpur we found mosquitoes breeding in enormous numbers in the paddy fields. In parts of Bengal they do not breed in paddy fields, and certainly in Gorakhpur and places round there, we do not find them breeding in the paddy fields to any great extent. It depends, I think, altogether on the actual chemical reaction of the water.

35,409. In the same note it is stated that there is a considerable amount of evidence to show that railway construction has been largely responsible for increase in malaria. Do you know whether the Railway Board agree with that?—I do not know whether they agree or not, but I think everybody else does. There have been no rules and regulations about the proper construction of borrow pits; they have been doing it in a haphazard manner. It is not only railways, it is also roads. In addition to that, the railways sometimes run right across natural lines of drainage which have not been given sufficient outlets, in the same way as I said about the canals.

35,410. In so far as malaria is due to railway embankments, that is a cause which should be capable of easy remedy?—Absolutely.

35,411. *Mr. Kamat*: With reference to the construction of wells in villages, do you think the method of construction is faulty and unhygienic?—It is certainly not hygienic.

35,412. In view of that, and in view of the fact that the construction of wells in villages is to be encouraged from the agricultural point of view, do you not think it would be a feasible proposition to enforce certain conditions through the revenue authorities before wells are allowed to be built?—I think you might ask Mr. Pim that. The revenue authorities are of course enforcing anything that the Government desire them to enforce, but I do not think from the point of view of policy they would enforce regulations which would seriously interfere with the social habits of the people.

35,413. But if your department suggest that certain hygienic conditions should be enforced in the interests of the health of the people, it would be very easy for the revenue authorities to see that those conditions were observed by the villages before constructing wells?—I do not think it would be easy. The difficulty there again is the social habits of the people; the well, according to their ideas, must be in a very accessible position, usually under a large tree with a platform round it in the middle of the village where in the evening they meet and talk on social matters; it is usually surrounded by houses with unhygienic methods of disposal of refuse, etc., with the result that those wells are almost invariably polluted. If one could get the villagers to sink the well far deeper than is necessary merely for the purpose of getting water, for instance, if one insisted that the *pucca* portion of the well cylinder should go down to a minimum depth of 50 feet from the surface, I would not mind where they put the well, because there would then be 50 feet of soil through which the water would be filtered before it got into the well. I should also like to have the well covered; we have undertaken great propaganda in these Provinces to get the people to accept a well with a permanent cover, such as a concrete dome with a pump in it.

35,414. In other words it becomes a choice between the hygiene of the well and the economics of the villagers?—Yes.

35,415. If the pucca portion of the well is to go 50 feet down, it will be expensive, and the villager regards it as essential to have a tree near the well for shade, though it pollutes the water?—He does.

35,416. Could you take a middle course and come to some sort of arrangement with the villagers by which hygienic wells could be adopted?—We have been asked to draft certain regulations on this very subject; as a matter of fact, I was drafting some rules yesterday. It was in issue as to whether the distance of the well from the nearest habitation in the village should be 50 feet or 15 feet; I was insisting on 50 feet, and my Secretariat friends asked whether I could not see my way to reduce the distance to 15 feet. I said I regretted I could not from a professional point of view.

35,417. You say the practice of boiling milk is good for adults from a hygienic point of view, but in the case of infants it destroys all the vitamins? —A great percentage of the vitamins is destroyed in milk by boiling; if the milk is merely brought to the boil and then allowed to cool off, the percentage of vitamins destroyed is smaller; if the milk is boiled for 10 minutes, practically all the vitamins are destroyed.

35,418. It seems to me it is a choice between two evils: if infants are given raw milk the chances of infection are great; if they are given boiled milk some of the vitamins are destroyed. Which of these two evils would

you prefer?—I would prefer them to do without the vitamins, because the number of infants who have to have cow's or buffalo's milk is very small; the majority are fed by the mothers.

35,419. So that the practice of boiling milk for infants must be tolerated?—It must be.

35,420. *Mr. Pim*: Reference is made in Dr. Banerji's note (see page 196) of the anti-malarial schemes adopted in Saharanpur; some years ago very severe restrictions were imposed as to canal irrigation in that district. Have those restrictions been maintained or modified?—In 1921, the Government, at the wish of the inhabitants of Saharanpur, allowed them to take up this irrigation again within a distance of, I think, half a mile. I regret to say they did not ask my opinion on the matter; I found out quite by accident that they had removed these restrictions; I promptly approached Government, and pointed out that the 3½ to 4 lakhs of rupees that had been spent in decreasing malaria from a spleen incidence of 84 to one of 7, which was an extraordinarily good result, would be wasted if the previous conditions were allowed to recur. The Government replied that this had been done for economic reasons, that the people had incurred a considerable loss owing to their not being allowed to grow crops on this area, and they asked me if I had any objection to this being done provided Government gave an undertaking that they would again impose the restrictions if I found the incidence of malaria again beginning to rise to alarming proportions. I said that if they could get an organisation that would see that all the canal water courses and *guls* were cleaned out every three months, kept straight and not allowed to be choked up with weeds as they had been before, in all probability the effect would be very slight and that in view of the economic conditions I would agree. That state of things exists at present; my malaria branch inspect the *guls* at Saharanpur once a quarter, and on their reports I keep Government informed. Up to date I have not found the necessity to recommend that the restrictions should be enforced; the water courses and *guls* are not kept as clean as they ought to be, but they are kept fairly reasonably clean, and they are not forming the breeding grounds for mosquitoes that they did before these restrictions were imposed.

35,421. You think this modified system works satisfactorily, provided reasonable care is taken in keeping the *guls* clean?—Quite satisfactorily.

35,422. *Sir Henry Lawrence*: I understand you have the support of the Legislative Council in your measures for public health?—I had in the last Council; a new Council has been elected and I have not raised the matter with them yet, but I understand, from what I hear unofficially, that they are quite favourable in every way.

35,423. Your grants have not been reduced as a matter of retrenchment?—No. As a matter of fact, I got a letter yesterday saying that in the debate in the Council last week the non-official members took exception to the delay in introducing the district health staff into every district of the Province owing to the lack of trained personnel; they asked whether it would be possible to do it if the Council were willing to supply the money to expedite the training of the personnel. I said of course it could, that I could easily hire further temporary buildings, employ more teaching staff, get further material, and instead of training in the restricted accommodation I have now eight or nine diplomates in public health every year, I could easily increase the number to 20, 30 or 40 if necessary, because the number of graduates wishing to come into the public health service exceeds the demand; I have a waiting list of 40 or 50 holding the degree of M.B., B.S. of Lucknow and other Universities.

35,424. Actually the grants you are getting for public health generally this year are 50 per cent. larger than last year; you have over 23 lakhs

in the current year as against 15 lakhs last year. I have got the figures of your budget here?—I do not know whether I am getting it or not; we are asking for it.

35,425. This is your sanctioned budget for 1926-27?—Yes, that is as compared with last year; we added the district health scheme to eight districts during the year, and in addition we had increased grants for anti-malarial work.

35,426. In your opinion, is a fair proportion of this money being spent in the districts, or is it largely going to the cities? I think your grant for urban sanitation was raised from Rs.1,35,000 to Rs.4,41,000?—Yes, contributions to District Boards during 1926-27 are Rs.2,71,000; that is practically all rural sanitation. The plague budget is Rs.2,03,000; that is practically all rural. There is Rs.1,00,000 for malaria. So that Rs.6,00,000 out of the Rs.9,00,000 which I directly administer is being spent in rural areas. That is the part I directly administer; the Board of Public Health administers Rs.9,82,000 during this year. You have got the details of their grants but I have not; of their grants, I think, Rs.4,00,000 was municipal, Rs.1,00,000 was for pilgrim centres and Rs.1,00,000 was rural. The money for pilgrim centres is practically all spent on places like Hardwar, Muttra and Ajodhya.

35,427. Is the money spent on pilgrim centres recovered in any tax imposed on the pilgrims?—Not grants made by Government, but Municipal Boards such as that of Hardwar have a pilgrim tax which in the case of Hardwar is 2 annas on the railway fare of anyone coming in from outside a radius of 30 miles.

35,428. It is financed by a tax on the pilgrims?—Yes, except in the case of a big fair like the one this year in which Government have had to come to their assistance. They had Rs.1,50,000 accumulated funds from the pilgrim tax, but Government have had to give or lend them Rs.2,00,000.

35,429. Was there a discussion at a recent conference of public health officers regarding the value of quinine for prophylaxis?—I do not think so. I was at the conference in Calcutta in December last. It was not discussed there, nor at the conference the year before.

35,430. It has been suggested to us that the conference held last December passed a resolution that quinine had no value from a prophylactic point of view?—If that was so, it has slipped my memory.

35,431. Do you agree with that view?—I do not think quinine is any good at all for prophylactic purposes, so far as the general public is concerned. In jails and regiments, where there is discipline, the position is different.

35,432. The distribution of quinine you advocate is for curative purposes?—Yes. I say there should be at least 100 grains of quinine available for any man who gets an attack of fever. Relapses after 100 grains treatment in benign and malignant tertian fever are only, I believe, between 40 and 50 per cent.

35,433. Have you worked out what amount of quinine would be required for this Province on that basis?—I have made a rough estimate that at least a quarter of the population of the United Provinces get at least two attacks of fever a year.

35,434. You want 320,000 lbs. for the United Provinces alone?—Yes. The All-India supply is 160,000 lbs., but to give 100 grains for each attack of fever we should require at least that.

35,435. Does your department advocate the pasteurization of milk?—It is very good, but it is very expensive.

35,436. It is not possible for villagers to pasteurize their own milk?—No.

35,437. Why?—On the ground of expense. The pasteurizing plant costs a good deal of money, and there is no local taxation in villages.

35,438. If milk were pasteurized, you would then retain the vitamins and destroy the infectious germs?—Yes, it is, of course, quite possible for Municipalities like Lucknow to do it, if they only would.

35,439. It can be done in the big cities?—Yes, quite easily.

35,440. *Sir Thomas Middleton*: You have explained that the danger of mosquitoes breeding in rice lands is confined to the areas where the soil is alkaline?—Not altogether. I am not absolutely *au fait* with the question, and I do not think anyone has yet carried out research on this subject, to find out what is the exact chemical constituent in certain waters that makes them unappetising to the anopheles mosquito. We know, however, they will not breed in water where peaty acid is present.

35,441. The alkaline soils are to be found very largely in your own Gangetic tract, I think?—Yes. I have no doubt whatever that certain alkalines are equally repulsive to them.

35,442. Have you any information from other Provinces on that point?—No; I know of no research to ascertain the reason why certain paddy fields are not bred in by the mosquito.

35,443. With regard to sugarcane irrigation, where do you think the chief danger resides: in the field itself or in the water channels?—In the water channels, I think. I am not an agriculturist, but I have noticed from observation that in sugarcane irrigation the water as a rule does not lie on the ground long enough for the anopheles mosquito to breed in it.

35,444. Then, if the water channels could be properly attended to, there would be little risk from sugarcane irrigation?—Very little, I think. Under the most favourable conditions, from the time the eggs are laid until the adult mosquito comes out takes eight days, so that the mosquito requires clean, undisturbed water for eight days. If it does not get that it cannot breed.

35,445. *Sir Henry Lawrence*: Can you tell us why the Punjab leads all India in the matter of malaria infection?—I served in the Punjab myself for five years. I do not think it is the Punjab as a whole that leads in malaria infection; certain areas of the Punjab are practically non-malarious. There are other areas, however, where it is undoubtedly due to over-irrigation.

35,446. *The Chairman*: Would you like to see some research carried on on an All-India basis into the question of deficiency diseases?—Yes.

35,447. And into problems of nutrition generally?—Yes, I think that is very necessary. The work Colonel McCarrison is doing is excellent and very badly needed.

35,448. *The Raja of Parlakimedi*: Do the local boards take great interest in the supply of pure drinking water?—I do not know what you mean by "great interest."

35,449. Are they devoting a certain amount of their revenue to that object?—District Boards do very little; they practically leave it to the villagers. The villagers have to build, clean and repair their own wells. The Board of Public Health has made numbers of grants to District Boards for the construction of wells according to approved patterns, but our difficulty is to get them to spend the money. For example, even when a Board gets a grant of Rs.12,000 to build 20 wells, we often find they do not spend the money for months and even years.

35,450. Do not you earmark it?—Yes, they cannot spend it on anything else, but we often find that after two or three years only a portion of the grant, or perhaps none of it, has been spent. I do not think the District Boards under the present system have a proper disbursing agency

for grants; they do not seem able to get proper technical advice or get hold of proper contractors for the construction of engineering works.

35,451. They are supposed to have an Engineer?—I am afraid some of the men with the District Boards can hardly be called Engineers!

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Thursday, the* 3*rd February*, 1927.

APPENDIX.

Note by Dr. A. C. Banerji, *M.B., B.S., D.P.H., Assistant Malaria Officer, United Provinces, on "The Rural Malarial Problem in the United Provinces, with special reference to the Agricultural Population."*

Malaria and agriculture.

The question of rural malaria is so closely bound up with that of agriculture that the one cannot be properly understood without some knowledge of the other. A close association has always been recognised between malaria and agricultural conditions, and it has long been known that a greatly increased prevalence of the disease almost invariably accompanies the decay of agriculture and the decline of cultivation.

In order to accurately estimate the effects of malaria on the agricultural prosperity of the rural population, it is essential that a survey of agricultural conditions both in malarious and non-malarious districts should be undertaken, along with investigations regarding prevalance of malaria. The necessity for such a survey will, I think, be readily admitted. The lines such a survey should follow must, of course, be left to the Health and Agricultural Departments. Without such a survey it is not possible to look at it from a statistician's point of view and to reduce the whole thing in terms of fall in revenue or in terms of untilled acres of land due to the effects of malaria.

I would therefore touch very briefly, on general lines, the question of incidence of malaria in the rural areas and the factors responsible for its prevalence.

Incidence of malaria in rural areas.

It is very difficult to get a correct estimate of the malarial incidence of any place in India from the present system of registration of vital statistics, because of the reporting agency. This difficulty is even greater in rural than urban areas. The reporting agency is an illiterate village *Chankidar*, and would record anything as malaria when the prevailing impression of a place is malarious. This impression, though it lacks the certainty of statistical data, is still of some value from the point of view of comparison.

The comparison in the annual mortality figures for malaria in urban and rural areas, according to the annual report of the Director of Public Health, United Provinces, is as follows:—

In 1920 the average for urban areas was 23·21 and for rural areas 31·31 per mille of population.
In 1921 it was 23·43 for urban areas and 30·48 for rural areas.
In 1922 it was 15·68 for urban areas and 20·35 for rural areas.
In 1923 it was 16·27 for urban areas and 17·26 for rural areas.
In 1924 it was 17·48 for urban areas and 21·13 for rural areas.

To have a death-rate, therefore, of anything approaching the figures quoted above, the case incidence of malaria must be extraordinarily high.

It has been estimated that a death from malaria corresponds to from 2,000 to 4,000 sick days, i.e., work-days lost It would thus appear that the real importance of malaria as a burden upon the public is not reflected in the mortality returns, however useful these may be in indicating the intensity of the geographical distribution. The economic significance of malaria in areas where it seriously prevails is disproportionately great in comparison with the actual loss of life attributed to the disease.

Even relying on these figures for the sake of comparison, it will be evident that although malaria exists in towns it is very much more prevalent in the rural areas.

Spleen rates.

It is recognised that the splenic enlargement gives almost a true picture of the malarial intensity in a population.

The statement given below gives the comparative figures for some of the urban and rural areas of the United Provinces:—

A comparative statement showing spleen rate in some of the urban and rural areas of United Provinces

URBAN AREAS.

Name of the place.	Spleen rate.	Remarks.
Lucknow...	2·2 % (1913)	Result of anti-malarial measures.
do.	1·6 % (1923)	
Bareilly	3·6 %	
Pilibhit	5·1 %	
Meerut	5·9 % (1911)	
do.	1·3 % (1923)	do. do.
Moradabad;		
Municipality as a whole	44·9 %	
Centre of the town of Moradabad	6·6 %	
Outskirts of Moradabad	54 %	Here conditions are those seen in truly rural areas.
Saharanpur	78·8 % (1909)	Where extensive irrigation, rice and sugarcane cultivation and other rural conditions existed.
do.	7·3 % (1923)	As a result of stopping rice and sugarcane cultivation within a radius of 1 mile of the town and training the Dhamola and Pandohi rivers.
Nagina	79·1 % (1909)	Extensive irrigation. Tanks and borrow pits.
do.	13·49 % (1923)	As a result of anti-malarial measures.
Hardwar Union consists of 3 wards as under :—	32 %	No anti-malarial measures have been taken as yet and conditions here approach riverain areas
Hardwar	60 %	
Kankhal	26 %	
Jwalapur	7·5 %	

RURAL AREAS.

Name of the place.	Spleen rate.	Remarks.
Railway areas.		
Moghal Sarai	62·8 %	Due to large number of railway borrow pits.
Moradabad Railway Area ...	88 %	do.
Lhaksar Railway Area ...	33 %	Large number of borrow pits flooding from the Pathri river.
Riverain tracts of certain districts.		
Moradabad Riverain in villages	91·7 %	Due to extensive flooding during and after the rains.
Bareilly-near Ramganga river	14 %	
Bara Banki District riverain areas	30 to 80 %	
Rural areas under extensive irrigation.		
Tarai and Bhabar estates:		
Gadarpur Tahsil	89·1 %	
Bazpur Tahsil	65·6 %	
Kicha	68·7 %	
Haldwani	12 %	Not much canal irrigation.
Kathgodam	17·6 %	
Kosi-Kalan (Dist Muttra)	81·3 % (1910)	
do.	42·5 % (1923)	Result of anti-malarial operations.
Kirthal District Meerut ...	18 %	
Other rural areas.		
Basti Town Area (district Basti)	12 %	
Phulpur Town Area (District Allahabad)	23 %	
Some of the eastern rural areas where there is not much canal irrigation:		
Jaunpur District ...	3 % (1914)	
Sultanpur District ...	62 %	
Benares District ...	·57 %	

" *Observations on the spleen rate.*

" (1) It is higher in rural areas than urban areas.

" (2) In smaller towns such as Saharanpur, Nagina, Hardwar and Moradabad, where conditions approach those seen in rural areas, the spleen rate was 78·8 per cent., 79·1 per cent., 60 per cent. and 44·9 per cent. respectively—a much higher index compared to the more modern towns such as Lucknow, Meerut, Bareilly and Pilibhit, where the spleen rate was 2·2 per cent., 5·9 per cent., 3·6 per cent. and 5·1 per cent. respectively.

" (3) The centre of the town, which is at a distance from the breeding grounds, suffers less from malaria than the outskirts, which are close to the breeding grounds. This fact was strikingly demonstrated in the investigations carried out at Moradabad and Lucknow; whereas the spleen indices in the heart of the cities of Moradabad and Lucknow were 6·6 per cent. and 2·2 per cent. respectively, the average figures for the outskirts of the same town were 54 per cent. and 25 per cent. respectively.

" (4) It is higher in places under extensive irrigation and rice cultivation, such as Saharanpur, Nagina, Kosi Kalan and Kirthal.

" (5) In the areas at the foot of the Kamaun Hills, known as Terai, which are water-logged and are under extensive irrigation and rice cultivation, and where there is no proper drainage, the spleen index is very high, averaging from 12 to 90 per cent., depending on the amount of irrigation, rice cultivation, and proximity to the hills and forests.

" (6) The big railway centres, such as Moradabad, Moghal Sarai and Lhaksar, which abound in countless borrow-pits, present very high spleen indices, e.g., 88 per cent., 63 per cent. and 33 per cent. respectively.

" (7) The riverain areas in the districts of Moradabad, Bareilly, Bara Banki and Saharanpur (Hardwar) have a high spleen rate, averaging from 14 per cent. to 91·7 per cent.

" (8) The eastern portion of the United Provinces was more lightly affected by fever than the western United Provinces, as will be seen from the spleen indices for Jaunpur, Sultanpur and Benares districts, which were 3 per cent., ·62 per cent. and ·57 per cent. (1914) respectively.

" (9) The west of the United Provinces contains much canal irrigation, which is usually associated with a high malarial index, but there may be other reasons.

" (10) By prohibiting canal irrigation, cultivation of rice and sugarcane crops, and by cutting water channels and certain other antimalarial measures, the spleen rate was considerably reduced in Saharanpur, Nagina and Kosi, as will be seen from the above statement."

Factors responsible for the prevalence of malaria and how to deal with them.

They are chiefly those that afford facilities for the breeding and multiplication of anopheline mosquitoes, and of these there are many in any village of the United Provinces; the principal ones being tanks, brick-kiln excavations, railway and road borrow-pits, railway and other embankments, *katcha* wells, canal irrigation, certain wet crops like rice and sugarcane cultivation, and floods.

(1) *Tanks.*—There is usually, if not universally, a tank or a series of tanks within a few yards of the village precincts; these are formed by excavations of earth for the construction of the mud walls of the village huts. Some of these are shallow, but most of these are deliberately deepened to hold water throughout the year for watering cattle and other domestic purposes. These are potential breeding grounds for anopheline mosquitoes and one of the chief sources of malaria to the inhabitants of the village.

To get rid of these tanks wholesale will be a great hardship on the villagers and would meet with strong opposition, as they have existed for centuries and are now looked upon as a part of the village itself. They are

also of considerable utility to the people for watering cattle, etc., and in some parts they serve as irrigation reservoirs.

The first step in any thorough antimalarial campaign will be to fill in all tanks within half a mile of any inhabited area, but, judging from the local conditions, it would be almost prohibitive to fill in all tanks. The minor tanks, hollows, depressions and ditches should be filled in. The big ones should be deepened, the earth so removed being used to fill in the minor depressions, and the edges should be kept free of grass and weeds, and should be straight cut and not shelving.

This is not a policy of perfection, but would, if carried out successfully, ameliorate conditions to a great extent. Villages which abound in countless tanks and *jhils*, cannot be improved and should be condemned and removed to suitable sites where better natural drainage exists. The earth from these condemned areas may then be taken to build up new huts for villagers. There is no paucity of land in India and it might be worth while to try this experiment. It might entail some expenditure on the Government in the way of compensation to villagers, but be well paid considering the prosperity of the agricultural population, which would eventually bring in more return for the money spent by an increase in the revenues.

(2) *Brick-kiln excavations.*—Half a mile may be regarded as the limit of flight of a mosquito, and no kiln excavations should be permitted within this distance from a village. This should not be difficult if a bye-law on the subject were passed by the District Boards. Such a bye-law exists for urban areas, and there is no reason why this cannot be enforced in rural areas in the interests of the health of the villagers.

(3) *Railway and road borrow pits.*—It has been shown that important railway centres such as Moghal Sarai and Moradabad, which are in close association with borrow pits, are intensely malarious.

The whole system of railway construction is wrong. Not only do the raised embankments interfere with the natural drainage of the country, but earth is taken for these embankments from too limited an area, resulting in a series of borrow pits of varying length, breadth and depth, which fill up with water during the rains and become mosquito-breeding grounds for varying periods after the monsoons.

This error has already crept in, and it is very difficult to get the railway authorities fill up these owing to the prohibitive cost. There is no reason why such a thing should be allowed to continue in the new railway constructions, and the only way to effectively stop such a practice is by legislation on the subject.

As for the existing ones, the only remedy lies filling up the borrow pits in all important railway centres and near big towns. In other places where series of borrow pits exist, it will be a sound policy to have a central *katcha* drain in the line of natural drainage passing from one end of the series to the other and falling into a deep pit, the earth from which may be taken to re-align the drain. This method will drain off the water from the borrow pits into the deep pit and reduce the surface areas for mosquito breeding to a great extent and would thus reduce considerably the mosquito population of the neighbouring area.

If possible, these deep pits may be stocked with larvicidal fish and tadpoles, which would eat up the anopheline larvæ and would thus help in reducing the mosquito population still further.

The road borrow pits.—These result from excavations of earth taken out to repair the roads, and for this the P.W.D. is responsible. These, I think, are necessary, but should be very shallow, not more than 6 inches to 1 foot deep, so that any water collected may dry up soon after the cessation of the rains.

(4) *Wet Cultivation. Rice and sugarcane.*—In rice and sugarcane areas, every available piece of ground is a rice or sugarcane field, and these fields absolutely surround the village. These are very profitable forms of cultivation and also a fruitful source of malaria, for they need constant watering and in fact are grown in water.

These, if possible, should be prohibited within half a mile of any inhabited area. There is no objection to replacing these crops by dry crops such as wheat, barley and maize in these areas, and this, if enforced, will, I presume, not meet with much opposition, as the villagers will be able to carry on some sort of a cultivation near their dwelling-houses.

(5) *Railway and other embankments.*—The increase of malaria that almost invariably follows the embanking of areas is due to the interaction of a number of factors, most of which have a direct bearing upon the breeding of anopheline mosquitoes.

The construction of embankments, apart from interfering with the natural drainage of the country, leads to a great amount of excavation, and the resulting borrow pits afford additional breeding places for anopheles.

There is considerable amount of evidence to show that railway construction has been largely responsible for increase in malaria. Before the advent of railways, there were few roads, and although river embankments existed in certain districts, they were rarely efficient in preventing inundation, because breaches were common, and more often than not the embankments were deliberately cut to let river water on to the fields. As there were few roads to impede the free passage of the floods across the surface of the country, the water flowed from field to field in the natural line of drainage and eventually escaped into permanent water courses such as streams, rivers, &c.

But this natural process of flood and flush was destroyed by the advent of railways which required embankments for their tracks and a system of feeder roads to convey passengers and produce to their stations, and in consequence flood water was shut out from the country, the natural system of irrigation was interrupted, drainage was impeded and the network of channels which used formerly to be fed by the spill water from the great rivers became silted up, and in many cases entirely destroyed.

All this resulted in appalling epidemics of malaria, a serious decline of agriculture and the progressive depopulation of the affected areas.

But railways and roads are also of vital importance as they play an important part in the social and commercial organisation of the country, and they will be needed in increasing numbers as development proceeds. Railways, when properly designed with due regard to the physical peculiarities of the country, so as not to interfere with the irrigation and drainage so vital to the agricultural prosperity of the country, are of inestimable benefit. Lower Egypt is a striking example of this This tract contains 3,100,000 acres of cultivation and no less than 2,400 miles of railway and 1,250 miles of raised roads.

Irrigation projects also require the embanking of the rivers in order that they may be adequately controlled and their waters properly utilised.

Railways, roads and river embankments are necessary therefore and must be provided for if future progress is to be assured, always remembering that they must take their proper place in the whole scheme of organisation.

(6) *Katcha wells.*—Where no canal irrigation exists the villagers resort to lifting water on to their fields from shallow *katcha* wells. When such wells are in frequent use, they do not afford much facility for breeding of mosquitoes. But for every such well in use there are several old and disused ones which fill up during the rains and hold water sufficiently long to produce many thousand mosquitoes. If these are within the range of half a mile of a village, they are a source of danger and should be closed.

Lieut.-Colonel C. L. Dunn.

(7) *Floods.*—Inundation by flooding from rivers is more extensive and more lasting in rural than urban areas as there is no proper system of drainage. The water stagnates until it is evaporated by the drying action of the sun and wind. During this period, mosquito breeding goes on unchecked, and if suitable meteorological conditions exist, malaria in epidemic form is the usual result.

There is no solution of this trouble except to concentrate our efforts in helping nature when the flood has subsided. It might be possible to drain off this water on to a larger area and so allow of more rapid evaporation.

If an epidemic of malaria is feared in such cases, oiling should be done on a large scale to kill off mosquito larvæ and travelling dispensaries should be detailed to distribute quinine amongst the sufferers.

(8) *Canal irrigation.*—It has been shown that places where extensive canal irrigation goes on have a high spleen index, such as Saharanpur, 78·8 per cent. (1909); Nagina, 79·1 per cent. (1909); and Kosi-Kalan, 81·3 per cent. (1910), and some of the tahsils of the Terai and Bhaber Estates.

The pecuniary advantages of canal irrigation, both to Government and to the farmer, are fully recognised, and are so well understood by the cultivators themselves that they would willingly take their chance of the contingent evils of irrigation in order to secure its benefits.

It must be admitted that canal irrigation is a great boon to the Province, without which the large tracts of land now under cultivation would have remained fallow, but is not an unmixed blessing.

The Eastern Jumna Canal or Saharanpur Canal furnishes examples of some of the best and worst results of canal irrigation. In the north and south divisions where the soil is light, the drainage perfect, and irrigation carried on chiefly by Rajbuhas, there exist all the blessings and scarcely any of the evils of a canal. But in the centre division, where the drainage of the country has been greatly obstructed and the soil is generally more stiff and clayey, the adverse effect on health is marked.

From various enquiries on the existing canals, it has been found that salubrity depends in a great measure on the nature of the soil and the efficiency of the surface drainage.

It would thus appear that if attention to drainage be made an absolute condition of participation in the benefits of the canal, an improvement rather than a deterioration of the general salubrity may, in many instances, follow canal irrigation.

The main canals and main distributaries are harmless enough except in so far that in some places they interfere with surface drainage and tend to raise the spring water level in the areas through which they pass, but the smaller channels, *guls* and *colabas* which finally conduct water to the fields are generally found to contain anopheline larvæ.

The main channels are under the charge of the Irrigation Department, and these are generally well looked after and free from danger, but the smaller *guls* and channels seem to be under no one's charge and are frequently overgrown with grass and weeds and choked up, and these afford suitable breeding grounds for anopheline mosquitoes.

If it is not possible for the canal authorities to take over the upkeep of these *guls*, the villagers concerned should be made definitely responsible for the portions of the *gul* that irrigates their fields. If necessary, a bye-law should be framed on the subject, with a penalty clause, and the punishment here should be the stoppage of water for a fixed period.

Summary of Measures.

Briefly summarised, the measures that must be adopted to avert the spread of malaria are as follows:—

(1) Prohibition of further embankments, tanks, brick-kiln excavations and borrow pits, &c.

(2) Survey of existing embankments and their waterways.

(3) Survey of river channels and other watercourses, with special reference to the drainage of the country.

(4) The mapping out of local spill areas and lines of drainage.

(5) Improvement of existing water channels.

(6) Examination of the local water-table.

In addition to the measures enumerated above, an attempt must always be made to determine, as accurately as possible, the existing conditions in respect both to malaria and agriculture.

Enough has been said to show that the prevalence of malaria in rural areas is inextricably bound up with agricultural decline, impoverishment and depopulation.

The amelioration of malaria in urban areas and in some of the progressive portions of the rural areas in the United Provinces is a relatively simple problem. In these areas much may be hoped from specific anti-malarial sanitation, whether aimed at destroying the parasite with quinine or the anopheles mosquito, and the results of such measures may be expected to be directly proportionate to the expenditure incurred.

But the question of the rural anti-malarial problem is an extremely difficult one. Financial considerations at the moment stand in the way, so that these measures cannot be applied at present on a scale commensurate with the evil they are designed to remedy; nevertheless, they must be given their place in the plan of campaign, and it is to these measures that we must eventually look for the final triumph over malaria.

Thursday, February 3rd, 1927.

LUCKNOW.

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.

Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja Sir KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.

Professor N. GANGULEE.

Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. H. A. LANE, I.C.S., Revenue and Judicial Secretary to Government, United Provinces.

Replies to the Questionnaire.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—The questions asked under these heads raise the fundamental problem of the position which Government should occupy in the general scheme of agricultural finance. Should Government extend their lending operations so as to compete with the professional moneylender and so force down his prices and, if possible, oust him? Or should they confine themselves mainly to making the scales as little weighted as possible against the borrower? Money is now lent by Government in the form of *taccavi* for two different purposes. The first is to give temporary relief in abnormal conditions such as drought or flood. For this purpose *taccavi* is given under Act XII of 1884 for the purchase of seed and is recoverable from the produce of the harvest for which it is given. The security in such cases is ordinarily the joint personal security of a number of cultivators of the same village grouped together for the purpose. The second purpose for which *taccavi* is given is to effect a permanent improvement in agricultural conditions by providing money for the extension of irrigation facilities. Such loans are usually given under Act XIX of 1883, though, in the case of machinery, Act XII is applicable. These loans are repayable by instalments spread over a number of years and are usually secured on landed property. The demand for loans for permanent improvement of agricultural facilities is comparatively limited, and requests made to Government for loans for this purpose are generally met, provided the security is satisfactory. The demand for loans for seed and bullocks is very different. Its extent is almost unlimited in the present conditions of agriculture. The cultivator borrows extensively for his ordinary agricultural operations, because he either has not sufficient surplus to build up a reserve, or if he has he is too ignorant and thriftless to use it for that purpose; so he has recourse to the moneylender, who, owing to the

high rate of interest charged, can afford to take risks in the matter of security and finds it profitable to keep debts running indefinitely. Once in debt the farmer finds it difficult to free himself. The elasticity of the moneylender's methods attracts the cultivator and makes the need for borrowing chronic even in favourable seasons. Till conditions change fundamentally and existing debts are cleared, the amount of money required as loans in each season to finance agricultural operations must be far beyond the sum which Government can provide. Even if Government could provide the money on easy terms of interest, it is doubtful whether they could oust the moneylender, except by making his profession definitely illegal. Any Government system of loans must be as rigid as the moneylender's is elastic. As soon as the rigidity of the Government system is relaxed, abuses creep in, and the cultivator suffers. If the impression gets abroad that distribution is not carefully watched, much of the money provided by Government goes astray. If it is found that prompt payment is not enforced, the cultivator is too ready to offer the collecting staff inducements to delay the day of settlement. Fresh loans are sought not for legitimate agricultural purposes, but in order to repay the existing loans. Even with the limited lending which Government now undertake, they find it difficult to exercise adequate supervision over the operations and the elaborate accounts which are necessary. They are now, therefore, revising the existing rules to ensure easier and stricter control, simplify the system of accounts, and prevent abuse and waste. If Government were to extend their lending operations further, petty officials would be multiplied and control will become impossible, unless the system were made even more rigid and the supervising and inspecting staff proportionately increased. The more rigid the Government system became, the more unpopular it would grow. There is, therefore, little scope for development of Government operations in this direction.

Government must, therefore, continue their present policy of using the indirect means which they can employ of reducing agricultural indebtedness, improving and developing their machinery as opportunities offer. They can by themselves providing and encouraging private persons to provide protection against drought make less frequent the recurrence of conditions which compel the cultivator to borrow. This policy Government have steadily pursued in the past. The canal system of the Province has been continuously developed, and the Sarda canal which will be completed within two years marks another long step forward. By giving loans under Act XIX, well construction is encouraged; the number of masonry wells in the Province has increased from 302,000 to 441,000 in the last thirty years. The power of resistance of the tenantry has developed rapidly in recent years: and widespread famine is now unlikely to recur. Government can also reduce the need of the agriculturist to borrow by shaping their land revenue policy in such a way as to leave with him as much as possible of the surplus which he earns. An increasingly liberal system of land settlement is one of the outstanding features of the administration, though it is one that is not always recognised. New settlement rules on much more liberal lines are about to come into force and mark another advance in this direction. Under them, the land revenue will be as low as about 2 per cent. of the value of the annual produce. Government can also try to reduce the opportunities of the moneylender to make exorbitant profits from the agriculturalist by such measures as the Usurious Loans Act. Such an Act is, however, difficult to make effective. The recent amendment has extended its scope, but even so it is doubtful whether it will bring about any substantial decrease in the rate of interest generally taken. Few agricultural loan transactions ever go before the courts, because it is not to the interest of the moneylender to terminate the loan. Many loans are given without any but personal security, and the courts find it difficult in such cases to avoid considering a high rate of interest as reasonable. It is also impossible to devise an Act of the kind

which will not be open to evasion. If such an Act could be made really effective its result would be to reduce the credit of the cultivator, but only up to the limits beyond which credit should not by economic laws be given; and the discovery that the cultivator can no longer raise money with the same facility as before would probably do more than anything else to induce him to keep his surplus profits towards building up a reserve. A Land Alienation Act is another direction in which Government might be able to protect the cultivator. But the problem is difficult, and opinion differs considerably on the desirability of such a measure in the United Provinces. The whole question was examined carefully in 1909, and the most experienced revenue officers then held that such an Act was not desirable. It was shown that conditions in the United Provinces differed fundamentally from those in the Punjab, that it was difficult in many cases to distinguish the agricultural from the professional castes and that by limiting the class of persons who might buy landed property the amount of land sold might well be increased rather than decreased without preventing the moneylender from acquiring it. Government are again examining the question and collecting figures from all the districts with a view to ascertaining whether the tendency of the last fifteen years shows that the former decision should be reconsidered. Other measures, such as the development of co-operative societies, do not concern the Revenue Department, and are therefore beyond the scope of this note. The general question of the surplus which the average cultivating family can save in different parts of these Provinces and the possibility of increasing it is fully dealt with in Chapter XXVI of the Government report,* which has already been submitted to the Commission, and need not be further discussed here.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The chief obstacle in the way of consolidation of holdings lies in the opposition of the villagers. The farmer has not only a sentimental attachment to the land which he and his forefathers have cultivated, but also practical reasons why he does not want his holding in one compact block. Land in nearly every village varies almost from field to field through almost imperceptible gradations of fertility; but, broadly speaking, it falls into three main divisions—superior, ordinary and inferior—according to position and the natural quality of the soil. Position may be good or bad according as it is either near or far from the homestead or a canal outlet. Other things being equal, the nearer land is to the homestead the more lavish is the expenditure of manure and labour upon it. But if irrigation is entirely from a canal and owing to its alignment the fullest and most regular supply of water reaches the outlying parts first, manure will follow water and the outlying area will be the best. The land in each of the three main divisions is suitable for crops of different types. Where the water supply is full and the land heavily manured the rotation will probably be sugarcane, wheat, and in the third year a double crop. In the area of intermediate quality, barley and *juar* will be most commonly grown, while the inferior tract will produce the poorer kind of crops, including some fodder crops. The cultivator requires every year crops of all these different types for his ordinary operations. He does not want to pay high rent for superior land to grow crops which inferior land can equally well produce. The landlord would also be faced with serious difficulties if all holdings were completely consolidated. He would have no difficulty in disposing of the holdings which consisted entirely of superior land, but he could hardly find tenants to take holdings composed entirely of inferior fields. Such holdings would have to be large in order to produce sufficient to give the cultivator a living. The superior holdings would then have to be reduced to an uneconomic size. Further, the inferior holdings would, in most cases, be almost entirely unirrigated and in years of drought the

* Report on Agriculture in the United Provinces. (Not printed.)

cultivator would have no crops at all in any of his fields and the effects of famine would be much more severe.

Complete consolidation of holdings is suitable to villages in which the whole of the area is homogenous both in quality and in irrigation facilities. Such conditions are rarely found in these Provinces. A further obstacle is the existence of partitions which in a high percentage of cases are by fields and not by compact blocks. In such villages, if consolidation is to be complete, landlords must be compelled to take tenants whom they may not wish to have. In the United Provinces, therefore, complete consolidation is neither possible nor desirable. Any attempt at compulsory consolidation would be deeply resented and by prejudicing the movement at the outset would probably do more than anything else to prevent its ultimate success. But some measure of consolidation would certainly be beneficial. It should be possible within the main divisions of soil to persuade the villagers to exchange individual fields so as to give each of them compacter areas. The new Agra Tenancy Act which has just come into force provides greater facilities for voluntary exchange of land. But the example of the Punjab shows that much propaganda and patience are necessary before even this limited measure can succeed. Even when consolidation has been effected, the Hindu law of succession must make it difficult to maintain, and any measure to alter the fundamental principles of the Hindu law in this respect hardly comes within the realm of practicable legislation.

Oral Evidence.

35,452. *The Chairman*: Mr. Lane, you are Revenue and Judicial Secretary to the Government of the United Provinces?—Yes.

35,453. We have your note of the evidence which you wish to put before us; would you like to make any statement in amplification of that at this stage?—No.

35,454. I should like to ask you questions on one or two general points before I turn to the substance of your note. I take it that you have had long experience in the districts in this Province?—Yes, about fifteen years in the districts.

34,455. What do you think is the general attitude of mind of members of your service towards economic development in rural areas? Is there a feeling that the Revenue Service is responsible at all for that?—Only indirectly, I think; it is not essentially their work; they are concerned with every department, but not as experts; the tendency nowadays is more and more for each department to develop separately.

35,456. Do you think the growth and extension of the Agricultural Department and the Agricultural Service has rather altered the views of your own service in respect of that particular responsibility?—I should say it has, certainly; the Collector previously was much more directly responsible than he is now. My experience is much more of settlement work than as a District Officer; I was nine years a Settlement Officer before I came into the Secretariat, and I have not really much experience of ordinary district work; but, speaking generally, I should say that was the tendency.

35,457. The improvement of the economic position of the countryside and of agriculture in particular is a very difficult undertaking and requires all the advocacy and all the zeal and capacity that can be mustered?—I should say the position is this: previously, the Collector had a more adequate administrative staff in all the larger districts in the Province when I first came out, for instance, in Meerut or any of the larger places. The Collector probably had one

if not two Joint Magistrates and an assistant; he now is there by himself; he has practically no assistance. The cadre of the I.C.S. is considerably reduced. The work is much more difficult in other ways, and it is very difficult for him to find the time that he would like to give to these things.

35,458. I was only concerned to get from you information as to whether it would be possible for them, in the circumstances in which they now find themselves, to interest themselves a little more in rural economics than in fact they do?—I think they are extremely interested; I do not think they can be more interested. The Collectors give all the time they can for these things; I think it is a question of time.

35,459. I understand from your note that from your experience you hold that the granting of *taccavi* loans is probably conducted on as liberal a scale as is compatible with public interest?—As is compatible with the machinery which the Revenue Department has.

35,460. You mean the kind of machinery or the extent of the machinery; is that the limiting factor?—The limiting factor is, I think, the staff available. The Revenue Department has not sufficient machinery.

35,461. Could you suggest any simplification of the practice?—Of giving loans?

35,462. Of examining applications. I suppose that is where the delay occurs, is it not?—The only thing which is necessary when an application comes in is to see whether the security is adequate; that is the principal thing. I am not aware that there is any very big delay.

35,463. In your experience what time elapses between an application from the cultivator and the granting of the loan; can you give us any indication?—I can only give my own experience of distributing *taccavi*, and then there is no delay at all. If the money is granted, say in October, it is straight away distributed.

35,464. Perhaps the principal criticism from the cultivator's angle is, as you suggest, the inevitable rigidity of the administration of the loans made from public funds, as compared with the moneylender's methods?—What happens is, when the staff goes out to collect, the cultivator is willing to pay Rs.5 or 10 to be allowed to postpone repayment for the next instalment, and he hopes eventually that the whole can be remitted.

35,465. The moneylender, of course, is perfectly ready to remit payments of interest provided the interest accumulates and his hold on the cultivator is thereby strengthened?—That is what he likes.

35,466. The new settlement rules will apply in the coming settlement?—Yes.

35,467. There is, I think, a Panchayat Act in this Province, is there not?—Yes.

35,468. How long has that been in force?—For about four or five years.

35,469. Have you any views as to its usefulness?—I have no experience of it at all.

35,470. Are there any signs of activity amongst the panchayats in villages in districts which you know intimately?—I understand (I am speaking simply from paper knowledge) that it depends entirely on how far the local authorities are interested in the thing, and it is entirely a personal matter. The extent to which the panchayat does or does not succeed very largely depends on the extent to which interest is taken and on the amount of supervision by the district authorities. It also depends greatly on the men available for the panchayat. There are certain areas in which they can succeed, and there are some in which they cannot succeed; that depends on the composition of the village community.

35,471. Do you come across caste panchayats at all in this Province?—For ordinary social purposes, yes, certainly.

35,472. But the caste panchayat does not operate outside the social sphere, does it?—Not directly, certainly. It imposes penalties for breach of caste rules and the like.

35,473. Did you ever come across a village in which the village panchayat was doing good work?—I have no experience; that is not my line at all.

35,474. Have you any experience of the co-operative movement?—*No.*

35,475. To return for a moment to this question of *taccavi* loans, do you conceive that it is within the realms of practical politics to extend the amount of capital available in the shape of *taccavi* loans to a point where it could approach the total requirements of the cultivator? The total amounts lent under both the Acts, the Land Improvement Act and the Agriculturists Loans Act, are really very small in relation to the aggregate requirements of the cultivator, are they not?—It is a question of increase of the Famine Insurance Fund as I understand.

35,476. I am really concerned to ask you whether you contemplate the extension, to that extent, of *taccavi* loans?—I do not think it is possible. Unless the existing machinery is enlarged to an extent entirely out of proportion to what it is, I think it is out of the question altogether to finance the whole of the agricultural operations.

35,477. So that, unless you are prepared to leave the provision of capital to the ordinary moneylender, it will appear that the co-operative credit societies offer the only alternative to the moneylender?—Yes, I think so. If you try to do it by Government agency you will have to have a separate department altogether; the Revenue Department could not possibly undertake it. Even now it is a heavy burden on the ordinary *tahsil* staff if you get scarcity or famine; there is all the accounting and that side of it.

35,478 Do you think that at the moment in the Province there is any competition between the Government through the *taccavi* Acts and the co-operative movement through its credit societies?—You mean by competition one is trying to oust the other?

35,479. Yes?—I should not think so. I think *taccavi* is regarded by Government as a means of meeting emergencies largely.

35,480. Rather than for improvements?—The *taccavi* does not go beyond the fringe of the question for ordinary works of improvement.

35,481. On the question of fragmentation, are you familiar with such experiments as may exist?—No.

35,482. *The Raja of Parlakimedi*: What is the usual period fixed for the recovery of *taccavi* loans in this Province?—Under which Act?

35,483. For irrigation?—Ten years; 20 half-yearly instalments.

35,484. Under the Land Improvement Act?—Yes.

35,485. Are not people allowed to borrow money to improve their fields otherwise?—Yes, for reclamation.

35,486. What is the period allowed for that?—The same period; it is the same Act, the Act of 1884.

35,487. Is there any limit fixed beyond which a person cannot borrow?—There is no limit under Act XIX of 1883. The rule is that if the period is more than twenty years the sanction of the Government is necessary.

35,488. The whole amount can be made available to a single person?—There is nothing in the rules or the law that prevents or limits, as far as I am aware, the size of the loan which can be given to any one individual.

35,489. Do you not think that it is desirable to do so, so that the money may be properly distributed?—I do not think that the question will ever arise, because Government sees that it is properly distributed.

35,490. We have observed in one case in Nagpur where a person has acquired a large area of property by *laccavi* loans, because of his influence or some such thing?—I do not think that you will find a case like that in this Province. I am certainly not aware of any such case. What happens in practice is that as soon as the budget is through, the amount sanctioned is allotted to the different Commissioners and they allot it to their various districts. The amount which is asked for in the budget is based on the report which previously comes from the Commissioners and, as soon as the budget is through in April, the amount is distributed and each Commissioner gets an allotment which he distributes to his districts. Of course, if a Commissioner comes up for an enormous sum of money for one project he is simply refused, because the money is not there to be given to him. But generally the Commissioner gets what he asks for.

35,491. The wells mentioned on page 204 of your note, I take it, have been increasing entirely for irrigation. You mention that these wells have increased from three to four lakhs. Is it because of the facilities for borrowing money for constructing them? Or do I understand that as it pays the people better to carry on irrigation from wells they have been constructing from private funds?—One reason is that in the western part of the Province the cultivator has more money to spend on that. I do not know what the percentage is of wells which are built by private funds but I should think the *taccavi* loans are only a small percentage of the total number of wells.

35,492. What are the rates of revenue adopted under these privately-owned wells? The cultivator has to pay upon his holding so much revenue to Government under this well irrigation. I want to know how much extra he would have to pay?—Nothing extra as revenue.

35,493. Is it because he maintains it entirely himself?—No. What happens is this: the Settlement Officer calculates the gross assets and from that he deducts an allowance equal to the extent to which the assets have been increased by the construction or improvement of the well. If the land was previously dry and is made wet by the construction of a well it will be assessed to revenue at dry rates for the period of the next settlement.

35,494. Is that the case in the talukdari areas also?—Yes, it is just the same. The Land Revenue Act applies to both Agra and Oudh. The law and the principles of settlement are roughly the same in both the Provinces.

35,495. At what intervals is the settlement carried out in these Provinces? —Up to now it has been thirty years; in future it will be forty years.

35,496. Is there a proposal to that effect?—It has been sanctioned by the Government of India for these Provinces.

35,497. The period of settlement is not twenty or thirty years?—There are no twenty years' settlements in these Provinces so far as I am aware. There are five years' settlements in alluvial *mahals* and certain precarious tracts.

35,498. In the Madras Presidency, in zamindari areas, the Act lays down that after twenty years if there is an appreciable amount of increase in the food prices the zamindar can apply for an enhancement of two annas in the rupee?—That is not settlement. I am talking about the revenue which Government takes from the zamindar.

35,499. He can apply for re-settlement also?—The system here is quite different from that which obtains in Madras. I understand the assessment you are talking about is the assessment of rent on the tenant. What we understand here by settlement is the settlement of revenue on the landlord.

The present position in the Province of Agra is that the landlord can get an enhancement of rent after twenty years and his revenue is fixed for forty years.

35,500. Is there nothing here like the Land Acts which we have in Madras which clearly state the conditions between the ryot and the zamindar and also what sort of security is required?—Yes, there is the Oudh Rent Act and the Agra Tenancy Act. There are separate Tenancy Acts for both the Provinces. We have had a new Tenancy Act passed for Agra as recently as 1926.

35,501. Do I understand that the ryot here has got sufficient security on the land so that he can increase the fertility of it and carry on improvements?—With very few exceptions that is the case.

35,502. We call them occupancy rights?—There are two main classes of tenant in the United Provinces: one is called the occupancy right and the other which has just been created in Agra is called the statutory tenant.

35,503. There are different areas where the ryot cannot acquire occupancy rights in zamindaries or what we call home-farm land?—There has been no acquisition of occupancy rights in *sir* up to now. Under the Agra Tenancy Act of 1926 the landlord can confer occupancy rights in *sir* but there is now acquisition of occupancy rights by prescription, i.e., by holding land for a certain number of years. That has just been altered by the new Act of 1926. If the landlord wishes he can confer occupancy rights in his own farm.

35,504. Can the landlord buy land and hold both the rights himself in these areas?—You cannot have zamindari rights and tenancy rights subsisting at the same time and in the same land and held by the same person.

35,505. So the zamindar cannot buy any area where occupancy has to be given to ryots and then lease it out to a private ryot for cultivation. In Madras especially there are areas in zamindaries in which, if a zamindar purchases land and leases it, the cultivator who enters upon the land and cultivates it cannot be ousted?—The tenant cannot; in the United Provinces he cannot be ousted now.

35,506. But there are lands also in Madras where the zamindar has got both kinds of land?—If the landlord's demesne is *sir* land in that case statutory rights do not accrue, so that there is no question of tenancy rights. The zamindar cannot have zamindari rights and tenancy rights in the same land. But if it is the landlord's, *sir* then tenancy rights do not accrue. The only right which the ordinary tenant has in *sir* lands is the right to hold them from year to year.

35,507. But supposing the landlord cultivates the land himself?—The present new law in Agra is that if he cultivates it for ten years with his own cattle it becomes *sir* land, and he can then let it to a tenant who would not acquire statutory rights.

35,508. It is not possible in Madras?—This is a new provision introduced in the Agra Tenancy Act.

35,509. *Sir James MacKenna*: The settlements are to be for forty years in the future?—Yes.

35,510. Have you any provision in your settlement arrangements for the revision of a particular tract during the period of settlement on account of violent changes in the conditions of the land; for instance, by the breaching of a bund a tract might be considerably reduced in value or by the construction of a protective work of irrigation the tract might be very considerably improved?—If the land deteriorates, yes; if the land improves, no. There is a provision in the Act enabling Government to appoint a Settlement Officer for this purpose.

35,511. It would be interesting to have a simple statement of the general land revenue system. You have been a Settlement Officer for many years and now you are the Revenue Secretary here. A start would be made with the 16-in. cadastral map which is usually provided by the Survey of India, or which was provided many many years ago, I should say?—It is always made by the *patwaris;* we have it done locally.

35,512. Starting off with that, what is the revenue system briefly?—The settlement starts off with the existing records which are revised annually. They are all based on this map.

35,513. Are they brought up to date annually?—Yes.

35,514. And are accretions assessed annually?—Not generally except in the alluvial *mahals,* which are under five years' settlements. The first thing which happens in the ordinary settlement is that when the records are revised, the map is thoroughly overhauled. Every individual who is interested in the land receives an attestation slip in which his rights are shown and if he has any objection he makes that objection in the Assistant Record Officer's Court. Those are all decided and the record is brought completely up to date. That is the records' part of the operation. When the Settlement Officer comes to the district the first thing he does is to inspect the villages and do soil classification, dividing up the whole of the land so that every field is placed in one or other of the soil classes. The different *chaks,* as they are called, are shown in the *patwari's* map. There is thus a map showing how the Settlement Officer has classified the soil, first class, second class, and so on. The maps go into the Setttlement Office, and on the basis of them the rentals are all analysed. What you then find, practically in the whole of the Agra Province, is that, according to the length of time during which a tenant has held a field, the rates of rents vary. In the western districts, for example, you will find that the old occupancy tenants, who have held the land for over thirty years, probably pay a rate which is about half the rates which tenants-at-will are paying now. You get a series of levels of rents for old occupancy tenants, the newer occupancy tenants, and the tenants who have held the land for periods between twelve and twenty years, beginning, say, from Rs.5 and going on to Rs.7, Rs.8, Rs.9 and Rs.10 an acre. There are two problems: at the one end, you have got controlled rents, that is occupancy rents which are extremely low, generally speaking, and at the other end you have competition rents which are pretty high. It is the duty of the Settlement Officer, in the fixing of rates, to see that he does not fix rates which will give an excessive enhancement of rents during the period of settlement. He fixes a standard rate for the occupancy land. The usual consideration by which he is bound in those cases is to avoid rates which will give too heavy an enhancement of rent on the occupancy land. Those rates are used for the valuation of occupancy land, and, subject to an allowance on account of proprietary cultivation, they are also used for the valuation of the land cultivated by the proprietor, and other land for which there are no cash rents. They are called assumption areas. For these, there are no cash rents, and it is necessary to find some standard by which to value the land which is not rented. The standard rates which are considered to be suitable for valuing the occupancy land are applied to the assumption areas after 25 per cent. deduction has been allowed in the case of proprietary cultivation. In that way, you get a standard for valuing your occupancy land and your proprietary cultivation. At the other end of the scale, you have got non-occupancy rents, and you will find from the statistics that the competition rents in Agra are generally so high that they are not ordinarily paid from year to year, and the problem in valuing non-occupancy land is to make the necessary allowance for short collections and the fact that the zamindar does not realise his rent in full from year to year. In the recent settlement this allowance

has been very liberal; generally speaking, it has been somewhere in the region of 20 per cent. of the recorded rent. Having made this allowance for instability, you have got your valuation of the whole of the land; that is known as the gross assets. From that is deducted the 25 per cent. allowance on account of proprietary cultivation which I have mentioned, and also any allowance which is necessary on account of improvements such as new wells, etc.

35,515. Allowances are made for improvements?—Yes. If a certain area has been converted from dry to wet, in the soil classification it is shown as wet, because it is wet; but from the gross assets you deduct an allowance equal to the difference in the valuation of the land at wet and at dry rates. In fact, you are assessing that land at dry rates, and that gives you the net assets. To these assets you apply the ordinary percentage at which revenue is taken.

35,516. What is the percentage?—Up to now, it has been, according to the rules, 50 per cent., but in all recent settlements it has been between 43 and 45 per cent., and by the new settlement rules it is 40 per cent.

35,517. When a Settlement Officer has completed his maps and records, what happens?—They are handed over to the *patwari;* the *patwari* is the man who is responsible for actually keeping them.

35,518. He has to keep them up to date?—He is supposed to keep all the maps up to date, but the maps are probably not kept up as well as the other records.

35,519. On a revision of settlement, you have a revision of survey?—Yes, but in order to reduce the cost only those fields are measured of which the boundaries have changed since the previous settlement. If two fields have been amalgamated, or one field is split up, there is a remeasurement, but not of the other fields.

35,520. In Burma, we have a pure ryotwari system?—The basis of the whole of the settlement here is rents. You have got your rents, and they give you facts; you use them as your guide as to what the value of the land is.

35,521. Who is above the *patwari*?—There is the supervising *Kanungo* above the *patwari* as inspector. By the rules, he is bound to check a certain percentage of the total number of fields with the map; he goes round and every entry which he checks he initials. He submits his reports to the Deputy Director of Land Records. Above him you have the tahsil staff, the Naib Tahsildar and the Tahsildar, who are also responsible for checking the records; there is also the Deputy Collector in charge of the sub-division, and he is expected to do checking work. In addition to that, you have also the Land Records Department.

35,522. What does the Land Records Department do?—They also check and give advice on the points which arise.

35,523. What is the strength of the department?—At present it is small. There are three Deputy Collectors and three Tahsildars, but Government have before them proposals to increase it considerably.

35,524. Are the *patwaris* and *Kanungos* attached to the Land Records Department?—There are only six of these special land records officers, and where they are attached to a district the *patwari* and the land records staff are under them. The special land records officer has the power of punishment, and in districts where he is permanent, he ousts the Sub-divisional Officer from the control over the land records staff, but he does not relieve the Sub-divisional Officer of the duty of checking the records.

35,525. The connection of the Sub-divisional Officer and the Tahsildar with the survey and settlement staff is very close?—Not during settlement.

35,526. After settlement?—They are responsible for part of the work.

35,527. There is not a considerable land records staff?—The special land records staff has up to now been experimental. Defects have come to light, and there is now a proposal before Government to have more special land records officers.

35,528. The ordinary District Officer is in very close touch with the cultivator?—Yes. Of course, now, he is getting less and less into touch with the cultivator, because the touring period has been cut down, in deference to the wishes of the Council. It is becoming more and more difficult for the Collector to keep touch with the people. His touring is cut down, the Tahsildars' touring is cut down, as also that of the Sub-divisional Officers; it is cut down right through. The tendency is not to allow the Collector to go into camp.

35,529. *The Raja of Parlakimedi*: Who conducts the *jamabandi*?—*Jamabandi* is one of the records which shows the rents and payments of rent.

35,530. It is done by a Sub-Collector in our parts?—The *jamabandi* gives a record of the rents collected by the landlord from the tenant, not the revenue collected by Government.

35,531. For the zamindari area in Madras it is called the quit rent. But the *jamabandi* officer has to report about the health of the people and the general conditions?—It is one of the duties of the *patwari* to make reports of epidemic diseases, and in his diary he records any event which is of interest. He has to report at once any outbreak of disease, or any calamity, or any of the more important things which happen in his circle; he has to report to the Tahsildar.

35,532. Is there a sort of annual inspection by the Sub-divisional Officer, an annual checking as to what work is going on in those particular areas? —The superior staff, the Naib Tahsildar, the Tahsildar and the Sub-divisional Officer have to see that the supervising *Kanungo* is checking properly. The duty of the officers above the supervising *Kanungo* is to see that his checking is effective; their attention is focused on the re-checking of fields which have been already checked by the supervising *Kanungo*, to see that he is not merely making a nominal check.

35,533. *Sir James MacKenna*: Before these restrictions on touring were introduced, what was the method? To go out for a period of three to four months at a time?—Yes, that was the usual thing.

35,534. Moving with tents?—Yes.

35,535. And the villagers used to go round to the Sub-divisional Officer's camp and the Collector's camp and talk freely with them?—The Collector and the Sub-divisional Officer were always moving about.

35,536. Meeting the villagers?—Yes; riding about and seeing the villagers.

35,537. The conversation was mainly concerned with cattle and agriculture?—About local conditions, local politics, their fights and factions, in fact, everything connected with village life.

35,538. About their general economic development?—Yes; they were getting intimate knowledge of the district.

35,539. With these restrictions upon touring, of course the touch of the District Officer with the villagers is becoming less?—It is difficult for the Collectors to keep in touch with them.

35,540. I think at one time there was a scheme by which young Assistant Commissioners were sent to Cawnpore to have agricultural training. Has that been abolished?—Instead of that, there is now a class for junior Civilians, Deputy Collectors, Tahsildars, and some Honorary Magistrates; there is a proposal to bring in Munsifs also. It is a general training class for all young officers.

35,541. Do they teach agriculture there?—They are taught the elements of soil classification, but not, I think, the technical side of agriculture.

35,542. *Sir Henry Lawrence*: Is there a farm there?—I could not say whether there is a farm at Moradabad or not. I think there is sure to be a Government farm there, but I cannot say definitely.

35,543. *Professor Gangulee*: On what data do you base your soil classification? Is there any particular principle that you follow?—The soil classification, so-called, would be more correctly defined as a classification of land values. It is not really a soil classification. What you try to do is to group together all land which has roughly the same letting value. The same soil, if it is near a village, will be in one soil class and if it is far away will be another soil class. It is a question of co-ordinating land values.

35,544. *The Raja of Parlakimedi*: That means also the productive capacity, I suppose?—Yes.

35,545. *Professor Gangulee*: You tell us that you have extended the period of assessment to forty years. What are the chief reasons for this extension?—I do not think I can hazard an opinion on this point. The reasons are partly fiscal and partly political.

35,546. Moving towards permanent settlement?—No, certainly not.

35,547. What is the proportion of net assets that is taken as revenue?—40 per cent. is the ordinary level taken.

35,548. How do you determine the net assets?—It is a complicated process. You determine a standard of valuation for different kinds of tenure, occupancy tenants and non-occupancy tenants, and proprietors' cultivation. That gives you your net assets. The standard of valuation is based on the levels which you find existing of the actual rents, and that gives you your gross assets. From that you make a deduction for proprietors' cultivation and improvements, and after deducting that you get your net assets. The problem at present, of course, is to find a valuation which is fair without being either inadequate or excessive.

35,549. How do you arrive at that standard?—It is all done on the basis of existing rates. You find in this Province that as the tenure becomes older the rent becomes lighter. You divide up your land here in this way. You find the rates of your old occupancy dating back to the previous settlement, of between twenty and thirty years, and of from twelve to twenty years, and of the non-occupancy up to twelve years, and you generally find the incidence of rent running in a regular series in nearly every district. If Rs.10 is the competition rent, it is clear the landlord can fairly ask for a higher rent than Rs.5, and the question is what enhancement he is entitled to. The standard you take for the value of all except non-occupancy land is the standard the Settlement Officer considers just in view of that series of incidences. The level usually taken is the general level of occupancy rents between twenty and thirty years old and the result is an enhancement of about 30 per cent. on old occupancy.

35,550. Has there been any attempt to define in various tracts the economic units of cultivation?—I do not understand what you mean by that.

35,551. It is a unit which a cultivator would require for producing sufficient to support him and his family?—You mean the area of land necessary for him? There is nothing I know of about that, except in the last chapter of the provincial Memorandum.*

35,552. It struck me that it was not quite clear what were the economic cultivating units in different tracts in this Province?—I do not suppose it is.

35,553. In your Muttra Settlement Report you make a very interesting observation on the effect of density of population on rent. Could you

* Chapter XXVI in the Report on Agriculture in the United Provinces. (Not printed.)

explain a little further what the actual situation is? Do you find the same situation in other districts?—Certainly. That is brought out in the last chapter of this memorandum. We show there that although the actual outturn of land is probably acre per acre the same in Meerut as in Gorakhpur, the rents in Meerut are twice as great. That, however, is another point and rather depends more on the size of the holding. I have never seen th density of population principle illustrated to the same extent as in Muttra. It is a clear case. I know the whole district intimately. We had the basis of all the crop-cutting experiments to go on. As far as one can see there is no appreciable difference between conditions east and west of the Jumna, yet competition rents on one side are double those on the other.

35,554. *Sir Henry Lawrence*: Was that due to pressure of population?—Almost entirely. On one side of the river there is competition for tenants and on the other competition for land.

35,555. *Professor Gangulee*: Do your subordinate revenue officials have some training in agriculture or rural economics? Would that help them in discharging their duties?—What type of official are you thinking of?

35,556. Revenue Inspectors, Tahsildars, and so on?—I should not think it would be the slightest use to a Tahsildar to have a training in agriculture. He would merely get a smattering of it, and he would probably get it wrong.

35,557. What is his education now?—It varies. Some are graduates.

35,558. Would you prefer an agricultural graduate to an ordinary Arts graduate?—As a Tahsildar?

35,559. Yes. Do you not think that a Tahsildar would profit by some training in rural economics, because he has to deal with conditions of rural life?—I very much doubt that he would be able to apply his knowledge. It might help.

35,560. Turning to the question of *taccavi*, is the demand for taccavi more for permanent land improvement than for temporary facilities, such as seeds, manures, etc.?—It depends entirely on the season. I have given figures for the last thirty years. If there is a famine or scarcity naturally enough the demand for seed goes up to almost any height and the demand for making wells does not increase to the same extent.

35,561. Is it more for seeds, manures and bullocks and less for permanent improvement, taking normal seasons?—The figures are here. It has been considerably more for seeds and bullocks.

35,562. Now, with regard to the Usurious Loans Act, has that been effective in these Provinces?—I should say hardly at all. I do not think there is one case in a thousand that it ever touches. One reason why it has been of little use is that until the amending Act this year it did not touch mortgages. I do not think the amendment will do very much. But it does at least cover mortgages now.

35,563. Is it not applied at the present time?—The *bania*, naturally enough, rarely puts his tenant into court. He does not want to realise his whole debt. There is also the difficulty that you do not know what attitude the court will take about a reasonable rate of interest. In the case of a loan given on no security at all the court may consider 25 to 30 per cent. as a reasonable rate of interest.

35,564. Sir James referred to the facilities given to Collectors in the old days. Was it the practice in those days to send in reports to the Commissioner?—The Collector sends in a report about a particular matter on which he is supposed to report to the Commissioner. The Assistant Collector has in the first four years of his service to submit a diary to the Collector, but the Collector does not submit any general diary.

35,565. When they used to send in reports, did these reports contain useful information about rural economics?—If any problem arose which required any action to be taken on it, the Collector would of course report to the Commissioner, but he would not sit down and write an economic history of his district, or anything of that sort.

35,566. Your point is that Collectors were more in touch with the rural population in those days?—They were moving about the district much more. Nowadays the Collector is more tied to his headquarters than he was. There are now a hundred and one things he has to go into headquarters for. His cold-weather tour is very much more broken up than it used to be.

35,567. *Mr. Calvert*: Is the Agriculturists Loans Act regarded here as an emergency measure?—To a great extent. The policy of Government is to use it largely as an emergency measure. I think the figures show that pretty clearly.

35,568. Can you explain how that idea arose?—Owing to lack of sufficient funds and lack of machinery in the *tahsil* it is quite impossible for Government to undertake the financing of the agriculture of a Province.

35,569. Of course the original Act was not confined to emergencies. The purchase of seed and cattle was an alternative?—Yes.

35,570. And the original Act was of course the result of the Famine Commission, which recommended such alterations in the old Act as would make the *taccavi* system more popular and elastic?—Yes.

35,571. Do you regard the rigidity of it as practically irremovable?—If you remove the rigidity, you at once open the door to a flood of abuses. That is my experience in *taccavi* matters. As soon as you relax control over collection and distribution and the management of *taccavi* generally, you encourage dishonesty and exactions by the petty officials. For instance, you get the *patwari* taking advances in the name of his pony and parrot, which I believe occurred once, and you get confused accounts and you find that a great deal of money which is distributed does not get to the cultivator and a good deal of what is paid does not find its way to the Government. As soon as the impression gets abroad that, if the tenant only delays matters he gets remission of his *taccavi*, you get abuses. That is the crux of the matter.

35,572. Does this Province lose much by having to remit loans under this Act?—The remissions have been pretty heavy. For instance, in the Muttra district, I think I am right in saying that something like three lakhs of rupees were remitted when I was Settlement Officer there.

35,573. The *taccavi* Acts were passed as an alternative to a proposed agricultural land bank?—Yes.

35,574. You admit in your note that the cultivator must borrow?—Yes.

35,575. In the original Act, you remember provision was made to allow Government to advance sums to cultivators through agricultural land banks?—Yes.

35,576. Would you advocate a return to that, allowing Government to advance money through agricultural land banks?—They would be co-operative credit societies?

35,577. Of course, in those days co-operative societies had hardly been heard of?—Yes.

35,578. You also say that the number of suits brought by moneylenders against agriculturists is not very great?—I should say so; I have no figures to go on.

35,579. You do not publish separate figures showing suits against agriculturists?—No; as a matter of fact, I tried to get figures when I was writing this resumé of the Act; the Judicial Department could give me no figures at all.

35,580. I could not get them either?—No, I do not think they are there; the Judicial Department said the only way to get them was to write to every District Judge, and then he would give you no information which was worth having.

35,581. You are rather pessimistic as to the desirability of complete consolidation?—Yes.

35,582. Have you yourself ever carried through complete consolidation in a village?—No, I have no experience of it at all.

35,583. Have you ever seen a consolidated village?—No, I do not think there are more than half-a-dozen in the whole Province.

Mr. Kamat: What is the *nazarana* system in the Lucknow Division?

35,584. *Professor Gangulee*: Is there any system?—I should not say there was any system.

35,585. *Mr. Kamat*: There is some practice of taking *nazarana* over and above the rent?—Yes, it is a fairly prevalent custom, I should say; of course, there are no statistics available on the subject, but it is more or less common knowledge that *nazarana* is taken fairly extensively.

35,586. What percentage does it form of the rent?—Until the Oudh Rent Act was amended it has been estimated by Settlement Officers that it was about 25 per cent. of the rent, but it is nothing like that now. Under the old Oudh Rent Act the tenant only held for seven years, and then he was liable to an enhancement of one anna in the rupee. What happened was that prices of grain went up enormously, and a rise of one anna in the rupee had no relation whatever to the rise in the economic value of land; the result was that the one anna in the rupee was recorded in the papers and the balance was taken in the form of a premium. It is a very natural system; I believe it is quite common in England. For instance, if you have a house to let and there is a great demand, you take a premium and then fix the rent. It is exactly the same system here; it has now been practically recognised in the Agra Tenancy Act, under which you can now sell off occupancy rights.

35,587. Do the Government take any share in the *nazarana*?—No, not directly; in most of the Oudh settlements what generally happened was that in regard to Agra non-occupancy land, that is to say, lands in respect of which the rents were not controlled, an allowance was made for instability; that is to say, if the genuine recorded rent was Rs. 10 an acre, it was valued for the purpose of assessing revenue at Rs. 8 an acre, allowing 20 per cent. for instability. In Oudh what was done was that the instability was set off against the *nazarana*, and the valuation that was taken was the recorded rent. As a matter of fact, even so, the recorded rent was probably a great deal less than what was actually collected. So that I think, generally speaking, you may say that Government in the past has taken nothing of the *nazarana*.

35,588. You say in your note that an increasingly liberal system of land settlement is one of the outstanding features of the administration?—Yes.

35,589. Will you kindly explain in detail how the land settlement has of recent years become increasingly liberal?—Firstly, in the methods on which the assets are calculated at standard rates: up to the Meerut settlement of about the end of last century the standard rates in Agra were based on the non-occupancy rates; that is to say, the standard of valuation

was practically the competition level. Now, for all occupancy land and proprietary cultivation in Agra the standard of valuation is probably, in the case of occupancy land, about two-thirds of the standard rate, and in the case of proprietary cultivation, 25 per cent. off two-thirds, which is somewhere about half the valuation. That is the first point, the valuation of the land. The occupancy land and the proprietary cultivation are probably now valued at about 40 per cent. less than they were at the end of the last century. Another respect in which assets have been very much more leniently calculated in recent years is the method of dividing the land into wet and dry. Looking at the old settlement records one finds that in the settlement of the eighteen-seventies and the eighties the land classed as wet was in most cases something about 80 to 100 per cent. above the average irrigated area. If one looks at a modern settlement one finds that the land classed as wet is about 30 per cent. above the average irrigated area. Those are the two points with regard to the question of the valuation of assets. In the eighteen-seventies there was hardly any allowance given for proprietary cultivation; now every proprietor who cultivates his own land is allowed 25 per cent. off the gross assets before the value of his land is actually calculated for assessment of revenue. The allowance for improvements is also more liberally applied than it was.

35,590. Taken in terms of percentage of the outturn, you say under the present rules, the land revenue is as low as 2 per cent. of the value of the annual produce?—Yes.

35,591. What percentage was it in former years?—There is a statement at the end of the Report on Agriculture in the United Provinces which I think brings that out pretty clearly. It goes back to 1840. The process has been going on steadily since then.

35,592. I see that your claim was 20 per cent. in 1840?—Yes, it was about 20 per cent. of the value of the outturn in 1840, and the process has gone on; as prices have risen, the value of the produce has naturally risen, but the revenue has not risen at all in anything like the same proportion.

35,593. You say on page 204 of your written evidence: "Government can also reduce the need of the agriculturist to borrow by shaping their land revenue policy in such a way as to leave with him as much as possible of the surplus which he earns." Is your land revenue policy shaped with the intention of preventing the agriculturist borrowing?—No, but that is one of the effects of it. It is fairly clear that if you leave more money in the pockets of the agriculturist, he has less need to borrow.

35,594. Even supposing you did not take 2 per cent. of his outturn, he would still borrow?—Presumably, yes; I should think he will always borrow.

35,595. Then, is it a sound policy to shape the land revenue policy in such a way as to prevent the agriculturist borrowing?—I do not say it is shaped with that intention; but by that means Government can also reduce the need of the agriculturist to borrow.

35,596. I want you to explain the percentages of surplus which appear in table "K" on page 115 of this Report on Agriculture. Taking the Jhansi Division as an instance, you say that the cultivating proprietor has a surplus of Rs.98 left after making allowance for his food, clothing, etc. Is that figure of Rs.98 in respect of a family of four or five persons?—It is the total surplus of a holding.

35,597. For a family?—Yes.

35,598. That is to say, it has to be divided by four or five?—Yes, it is for the whole family; it is the surplus on the holding.

35,599. You have not made any allowance for any other items of expenditure except food and clothing in the family budget of a cultivator?—There is a full description here of what has been included and what has

not been included; there is a certain amount left out on both sides. It does not pretend to accuracy; it is quite impossible to get accuracy in these things; it is merely intended to indicate tendencies and to enable anybody reading it to draw conclusions from economic conditions which arise from different sizes of holdings.

35,600. It is not based on the examination of actual family budgets of cultivators?—I do not quite know where you are going to get a cultivator's family budget.

35,601. At any rate, no allowance has been made for expenses of such things as marriages and funerals?—No, it is quite impossible to estimate them.

35,602. Or litigation?—No, anything which it is quite impossible to estimate has, of course, been omitted; we have included anything which we consider can be estimated with reasonable accuracy; anything which varies from year to year or with the individual, or as to which it is quite impossible to get figures, we have omitted. That is mentioned in the letterpress.

35,603. I want to find out whether certain legitimate expenses which every family has to incur have been allowed for when you claim that cultivators have a surplus?—But we do not claim that cultivators have the surplus shown; we claim that, leaving out these things, this is the figure. Everything that is left out is described here; seed, *bhusa* and litigation are left out.

35,604. If all these things are deducted, then what may be a surplus may perhaps be even a deficit?—It may be anything.

35,605. *Professor Gangulee*: When you talk about an average holding what do you mean? What is the area?—It is described in the provincial memorandum. It is based on the area of the land the cultivating household has got. The average size of the holding is shown in table "F".

35606. *Mr. Pim*: You said in answer to Sir James MacKenna that in the case of improvements made within the period of settlement Government never gets any share of the increased assets resulting from the improvement, though the revenue may be revised in case of deterioration. Is owner's rate a partial exception to that?—Yes; if a new canal is brought in Government gets the owner's rate certainly. I was thinking of the revenue assessment actually.

35,607. As regards the allowance for improvements made at settlement, the general effect of the rules is that the additional asset caused by the improvement should not be assessed at the next settlement. Is there any period within which the improvement must have been made?—Under the new settlement rules?

35,608. Yes?—I think it is thirty years; I do not remember exactly.

35,609. There is a sentence at the top of page 205 of your note. You say with regard to the Land Alienation Act: "The problem is difficult and opinion differs considerably on the desirability of such a measure in the United Provinces." That is of course, broadly speaking, true. But is there not one part in the United Provinces where there is such an Act?—There is an Alienation Act in force in Bundelkhand and the southern parts of the districts of Etawah, Allahabad and Mirzapur.

35,610. Do the reports so far show that it is working satisfactorily?—Yes.

35,611. Another witness has said that he did not think there would be any serious disadvantages from making over the assessment and collection of irrigation rates to the land revenue staff, the irrigation staff simply taking their figures from the land revenue staff. What would you think of

such an arrangement?—I think it would be fatal from the point of view of the canal revenue because, for one thing, you have under the present system one set of records checking another, and another point is that the *amin* is a Canal Department man and the *patwari* is intimately connected with the interests of the village. He is appointed on the recommendation of the landlord and his tendency would certainly be to fail to write up a good deal of the irrigated area.

35,612. *Sir Henry Lawrence*: Is there any part of this Province where there is a shortage of labour?—I could not say off-hand. It is not a question with which I am familiar.

35,613. Do you know what the ordinary rate of wages for field labour is?—It is reported that in the Meerut Division it is about 6 annas for a female and 8 annas for a male and elsewhere it is 4 annas for a female and 6 annas for a male.

35,614. One witness from one district has told us it is 1½ annas for women and children and four annas for a man?—In what part of the Province?

35,615. Rae Bareli?—It is quite possible that those rates might be paid by the landlord; but they are not the market rates——

35,616. *The Chairman*: How comes it that the landlord gets his labour below the market rate?—He makes a *quid pro quo* in some way or other. The landlord can usually dictate terms to the people living in the village. In some estates the landlord has a customary rate of labour; really it is part payment of rent; it varies from village to village.

35,617. *Sir Thomas Middleton*: How is the market rate ascertained?—We ask the Collectors what is ordinarily paid in the villages and that is how we get the information. As far as I know there is no publication in which the figures are quoted.

35,618. *Sir Henry Lawrence*: Is Rae Bareli one of the districts where there is severe pressure of population?—It is a pretty highly populated district.

35,619. Are wages generally lower in the east of the Province than in the west?—They are higher in the west certainly and therefore they are lower in the east. I should say in Bundhelkand the wages are lower still; but it is merely a guess.

35,620. Has the Government any definite policy in allowing labour to migrate where there is a severe pressure of population?—I do not think that Government intervenes in the matter at all. There is no question of encouraging or discouraging in the matter, so far as I am aware.

35,621. Is there not a law which restricts emigration from this Province to Assam?—There may be; I could not say. I am not familiar with that Act. I believe there is an Act.

35,622. I understand from a Government Order that Government have restricted the movement of labour to Assam except from five Divisions, including Fyzabad, Allahabad and Jhansi. That means that migration is prohibited over a considerable portion of the Province, does it not?—Yes.

35,623. Does that prohibition extend to districts where there is a severe pressure of population, and where wages are low?—I have no knowledge of the subject. It is not a question I have any experience of. It belongs to the Industries Department and not to the Revenue Department.

35,624. Is there any feeling in the Province that labour is required for field operations and therefore could not be allowed to move out of the Province?—I am not aware of any shortage of labour. In fact the ordinary labourer does not work every day in the year.

35,625. Is this matter taken up very much by the local press or by the politicians?—Shortage of labour?

35,626. The desirability of maintaining labourers on the land?—I am not aware of any discussion.

35,627. You do not know of any strong public opinion in the matter?—No. There is always a public opinion against anything in the form of indentured labour, but the reasons, I think, are not economic.

35,628. There is no indentured labour here?—No; there is a feeling against anything which tends in that direction.

35,629. Is there any particular prejudice against migration to Assam on those grounds?—That I cannot say.

35,630. Have you heard of it?—No; I have not heard of it. Do you mean political prejudice?

35,631. Political or economic or whatever it is, is there any?—All I know is there was an agitation against the Bihar estates getting the labour. It was one of the points in non-co-operation times.

35,632. But the conditions in regard to Bihar are quite different from those in regard to Assam?—Yes.

35,633. There is no restriction with regard to Bihar, but there is restriction with regard to Assam?—I am not familiar with the reasons.

35,634. You have just now told us that District Officers are not very closely in touch with the districts owing to retrenchment in touring?—That is one of the reasons, I think.

35,635. Has the touring grant been very largely cut down?—I cannot give you the figures, but certainly the periods have and the grant has.

35,636. The period of the touring is reduced by Government orders?—It is reduced presumably because the grant for it is not forthcoming.

35,637. Was the grant cut down by the vote of the Council?—I really could not tell you the history of the matter. Why it was cut down and whether there was actually a cut in the budget I could not say.

35,638. In this Province, is the time of the District Officer largely occupied with magisterial or criminal work?—Not of the District Officer, no. The Collector and District Magistrate only takes up important cases. He has got certain appellate work, but the original criminal work the District Magistrate would not take up unless there are special reasons for doing so.

35,639. The work of the Assistant Collector is mostly magisterial?—Yes, plenty of it; he has got a heavy file.

35,640. Both in Agra and Oudh, this is the case with the Assistant Commissioner and the Assistant Collector?—Yes, he has got a great deal of case work to do. In the bigger places, in Lucknow for instance, there is a City Magistrate, and my own experience is that the average Sub-divisional Officer has got a pretty heavy file of criminal as well as revenue work.

35,641. Does it occupy, say, 40 or 50 per cent. of his time? Can you give me a figure?—In court hours, I should think 70 per cent.

35,642. That also diminishes his zeal for prosecuting economic inquiries?—The ordinary officer when he is out in camp, goes out to the villages in the morning and sits in court during the day. When I say 70 per cent., I mean of the actual time spent in court. What generally happens in practice is that he spends most of his court time on criminal work, and what time he has left he devotes to revenue work.

35,643. Would you like to see him relieved of his magisterial work in order to put him in touch with the economics of his district?—That would

be a doubtful policy. A lot of other considerations come in. It is a very big question, and I should not like to express an opinion offhand. There are many obvious disadvantages.

35,644. Do I understand that in your opinion there is no difficulty felt by landlords or tenants in improving their agricultural holdings owing to the fear of taxation on improvements?—I should say none. There is very little fear of that, I should say. They might not do it just before a settlement, but I think it would be incorrect to say that the fear of having the revenue assessed on improvements is any drag on the making of improvements.

35,645. And is capital actually being invested in the improvement of land? —Certainly.

35,646. Is there a continuous process going on?—A very large number of wells are dug every year. There has been a tremendous development in well construction during the last thirty years.

35,647. Before settlement comes on, is there any retardation of improvement, say, in the cropping system?—I should not say so; there is no indication of it. In the district which I have settled, where there is a tendency to introduce improved crops in the way of new Pusa wheats, there is certainly no indication that the villagers were afraid that the introduction of improved crops would mean a heavier assessment. The reason for this is that the assessment is made on the rent; it is not made in this Province on any estimated outturn. There is no estimate made of the value of the crop at all. We work on the basis of the existing rents.

35,648. How would that apply to assessment on *sir* land, home-farm land? —It is impossible to say what suspicions the landlord might have at the back of his mind against the Settlement Officer, but I cannot imagine that it constitutes any check on the development of agriculture; all the indications which I have seen are in the opposite direction. Even in districts where it is known that the settlement is pending, especially in the Meerut Division, the people have gone on steadily introducing improved crops.

35,649. We have had evidence before us which was just the other way, in fact one landlord definitely told us so?—There are landlords like that, but they are not common.

35,650. *Sir Ganga Ram:* How many districts are permanently settled in these Provinces?—Benares, Jaunpore, Mirzapore, part of Ballia. There are also scattered areas in Oudh which are permanently settled.

35,651. In these districts are the settlements governed by the same rules as obtain in Bengal?—There are rules as regards the tenant and the landlord, and the Agra Tenancy Act applies.

35,652. Can the landlord take any rent from the tenant, or is the law of tenancy laid down there?—They are governed by the Agra Tenancy Act.

35,653 The rent which he can take from the tenants is regulated by some law, is it not?—What happens is that a very great number of the tenants are fixed rate tenants; their rent cannot be enhanced.

35,654. But the rent that they take from the tenants is recognised by law, is it not?—The rent is not fixed by law, but the law regulates that there cannot be any enhancement to the rent of a fixed rate tenant.

35,655. I had occasion about ten years ago to visit a village in the Darbhanga district of the Province of Bihar and Orissa, and I found the tenant was being charged Rs.15 an acre, whereas the landlord was only paying 3 annas per acre? Can the landlord charge any amount he likes?—He can charge anything he likes provided the land is not fixed rate, ex-proprietary or occupancy land. If it is non-occupancy, he can charge anything for it.

35,656. And in the case of occupancy?—That is liable to regulation.

35,657. In these Provinces, is a man with occupancy rights subject to the law of inheritance or the Hindu law?—It is a special law of succession; it is not the Hindu law of succession. The order of succession to tenants is a special order of its own. It is given in the Tenancy Acts. It is not quite the same as the ordinary Hindu law, but it is very like it. It is different in some details.

35,658. On page 204 of your note, you say that the number of masonry wells in the Province has increased from 302,000 to 441,000 in the last 30 years? Is that right?—Yes, those are the figures.

35,659. If I am wrong please correct me. I take it that it amounts to something like 4,600 a year?—I suppose it does.

35,660. And you might put down, say, five acres of protected area under each well. It would not protect more than five acres, would it?—Perhaps not.

35,661. My calculation is that, taking 50 million as your population and after deducting all the areas that you have protected, you have still to protect 10 million acres of land which still remains unprotected at present. The Sarda canal, I understand, is only going to protect 300,000 acres, and it cannot protect the remaining portion. I may be wrong in my calculation, I am not sure, but you might tell me?—Government does not undertake to convert the whole of the dry area into wet. Government are pushing the thing forward as much as possible so far as funds are available; the Sarda canal scheme is costing a great deal of money.

35,662. But that would only protect 300,000 acres?—I was under the impression that it was a good deal more.

35,663. Then, another question has been asked by my colleague and it has been answered, but I want to go into the figures. You say that under the new settlement rules the land revenue will be as low as about 2 per cent. of the value of the annual produce. Formerly it was one-sixth or 16 per cent. It is given in Lord Curzon's land policy?—There have been very big changes since the year 1901, that is during Lord Curzon's time, not only in the revenue policy but also in the rise in prices.

35,664. Has it come down to 2 per cent. now as you say?—Yes.

35,665. That leaves 98 per cent. for other people. Can you give us a rough idea as to how the 98 per cent. is disbursed, that is to say, how much to the landlord, how much to the tiller and how much to the bullocks? Could you work out these figures and send them to us?—The figures are already given.

35,666. What I mean to say is this, that if Government takes 2 per cent., then 98 per cent. of the gross produce is left to the other people. What is the detail as to the disposal of this remaining 98 per cent.? You have been a Settlement Officer, and I am asking you this because of that fact?—Table J of the Report on Agriculture in the United Provinces is as far as we can get to. It gives the cultivators' expenses, the rents and the revenue.

35,667. I want to reduce it to figures?—We cannot give any more figures than have been given in the last chapter of the report, because it depends on the individual cultivator.

35,668. Are the minor streams supposed to be the property of Government or the property of the adjoining villagers? Can anyone put up a pump and take the water without the sanction of Government, or is it necessary to have Government sanction?—They are not Government property. The stream belongs to the landlord. If there are two villages, one on each side of a stream, the dividing line between the villages is in the middle of the stream; the stream is not Government property.

35,669. Can anyone put up a pump and take the water?—If the landlord will let him; it is his property, and he can do what he likes with it. It has nothing to do with Government at all.

35,670. In the Punjab, all that is governed by the Drainage Act or some other Act?—I am not aware of it. I know several pumping schemes on the edges of streams. I have not heard of any provision of the law which prohibits a private individual from putting up a pumping scheme on the edge of a stream.

35,671. *Mr. Calvert:* Is that the case with forest streams?—It is not the case with streams inside the forests, but here I am thinking of agricultural land.

35,672. *Sir Ganga Ram:* In agricultural land, there is no prohibition?—I am aware of none.

35,673. If the stream passes through the properties of a number of persons, can the man in the upper reaches of the stream pump up the water to the detriment of the persons further down the stream?—No. There is a provision in the Canal Act which enables Government to notify as regards certain areas that they are controlled by the Irrigation Department. The position is that Government can, if they consider it necessary, assume control of a certain stretch of river, but until they do so there is no control by Government.

35,674. When you make survey maps for your settlement purposes, would it not be advisable to put the contours on it, say, five feet apart, so as to show at a glance how the lay of the land is?—For whose information?

35,675. In your settlements you make survey maps of each *tahsil*?—We make survey maps of each village.

33,676. So much the better. I only suggest that you should put on the map contour lines, five feet or two feet apart, so as to show everyone how the land lies, so that he can know where to take the water, and how to take it?—For whose information is this? For the cultivators' information?

35,677. For everybody's information; everybody will be enlightened by that system?—I think the cultivator would know much more how to take the water by looking at the ground than by looking at the map.

35,678. *Sir James MacKenna:* Do you know if the contours are given in the one-inch maps?—I do not think the contours are given in the Government of India survey maps, so far as I am aware. The difference in the levels of an ordinary village will be practically nothing.

35,679. *The Raja of Parlakimedi:* They are given in the district maps?—They are shown in the hill maps, the forest maps.

35,680. *Sir Ganga Ram:* It would be very useful information for purposes of irrigation. They can decide from the contour maps how to take the water. You know that sometimes tremendous mistakes are made?—There is no objection whatever, if the Irrigation Department think that these maps will be of benefit to them, to their preparing such maps.

35,681. For ordinary general purposes, do you not think they will be of use?—I do not know how the *patwari* is to do it.

35,682. He can easily get the information from the Survey of India maps?—These are village maps.

35,683. You can easily reduce it to the village maps?—There are no contours in the Survey of India maps.

35,684. The Act that I was referring to some time ago is the Northern India Canal and Drainage Act. It says: "Whereas, throughout the territories to which this Act extends, Government is entitled to use and control for public purposes the waters of rivers and streams flowing through their

channels, and all lakes and other natural collections of water. . . ." Are these Provinces governed by this Act?—The preamble you have read out says that Government is entitled to control. In these Provinces, also Government are entitled to control; they can issue a notification.

35,685. In these Provinces, do you think that the cultivators have any spare time hanging on their hands? Is it a problem to find out cottage industries for them?—The cultivator is not working 24 hours a day.

35,686. Is there any spare time in the year which he cannot use profitably? It is put down by some people that for four months and in some cases for six months, he has nothing to do?—He has certainly slack seasons when he is doing little; the hot weather, for instance.

35,687. Have you thought of any method by which he can employ his spare time profitably? For instance, sheep-grazing, or something like that? —There is nowhere to graze sheep.

35,688. There is a lot of spare land?—It is land, but there is nothing on the land. It is bare earth; there is no grass on it.

35,689. *Sir Thomas Middleton*: With reference to the time which Collectors are now able to get for studying the economic conditions of their districts, you have explained that in recent years the Collector's work has been specialised and that his travelling facilities have been cut down. To what extent does the Collector now deal with such other subjects as education, roads and forests, which are specialised departments?—He deals with them more or less generally. References are very frequently made to the Collector by other Departments, and he gives help when it is wanted. In forest matters, generally the Collector has very little to say.

35,690. He helps them generally. Does he do the same in connection with the Agricultural Department?—If the Agricultural Department asks the Collector's help in any way, I think I am safe in saying that it is given.

35,691. Is he in any official sense the centre of the district for all these Departments?—No, I do not think so; it is difficult to answer the question as regards centre of the district.

35,692. There is certainly nothing laid down officially that you know of?— You are thinking of agriculture?

35,693. Agriculture and all the departmental work that is going on. I have instanced roads?—I should not say that there is any definite instruction on the point. It is a point which is regulated by custom; there are certain things which require a definite reference to the Collector.

35,694. *Sir James MacKenna*: What about the Commissioner of the Division?—I do not think if an agricultural officer wanted to have anything done he would go to the Collector; I think he would recommend it to the Commissioner.

35,695. I was thinking of the other branches of the administration, the Forest Department and the Public Works Department?—What happens is that in some cases for local matters they go up to the Collector, and it comes up to Government through the Commissioner.

35,696. *Sir Thomas Middleton*: You mentioned, I think, that the man who is doing settlement work has much better opportunities of coming into close touch with the agricultural and economic matters than the Collector? —He is out for five months at a stretch without getting back to headquarters, and the whole of the time he is out in the villages. He is out every day at 7.30 in the morning, and does not come back till 4 in the afternoon.

35,697. How often do the settlements recur in these Provinces?—Thirty years; now it will be forty years.

35,698. About how many settlements would be in progress in the Province at a time?—There are seven now; it depends on the programme.

35,699. How many districts have you?—Roughly fifty. Some of them are permanently settled; there are no settlements in the Benares Division.

35,700. You have explained that your settlement starts on the basis of the existing village maps and papers. These village maps in the United Provinces are, I think, pretty old. When was your cadastral survey made? When were the village boundaries laid out?—They are pretty old. I could not say when the village boundaries were laid out.

35,701. These village boundaries were no doubt laid out working on the triangulation method of the topographical survey. Have you any reason to suspect that these village boundaries may be inaccurate?—Not substantially; not enough to make any difference for the purposes of the Revenue Department, certainly.

35,702. When you do your field surveying, do you find that the field boundaries have changed?—There is a difference in areas.

35,703. Are these differences in areas substantial?—Not very much.

35,704. Errors of 5 per cent. would be common?—I should think not 5 per cent.; we very seldom find anything as big as 5 per cent.

35,705. With reference to the question put to you by Sir Ganga Ram about levelling, I do not think your settlement parties are provided with levels? —No. They would not do levelling at all; they are not trained in that way. The surveyor is the *patwari* himself, and he is not trained in any way to take levels.

35,706. What does he work with?—A chain, a right angle and a compass.

35,707. What is the longest period for which you grant loans for permanent improvements?—There is no limit. The ordinary period is ten years, but if it has to be extended to over twenty years Government sanction is it can be extended to twenty years with the sanction of Collectors, but if it has to be extended to over twenty years Government sanction is necessary.

35,708. The ordinary period is ten years?—Yes.

35,709. So that the sinking fund will be pretty heavy?—Yes.

35,710. Have any complaints been made of the short period for which loans are given?—I have never heard any at all.

35,711. The point has not been taken up?—I do not think there is any indication that it is considered too short a period. There is no indication that there is any unwillingness to go in for *taccavi* loans on account of the short period.

35,712. You do not think that the sinking fund required for a repayment in ten years has restricted the development of wells, for example?—I do not think so.

35,713. Has any one attempted to estimate the charge in these Provinces, which the indebtedness bears to the gross produce, the interest charges?—If you mean agricultural indebtedness, I do not know. It is quite impossible to make a reliable estimate.

35,714. Did Mr. Moreland make no attempt to estimate it at all?—He may have. I am not familiar with that.

35,715. At any rate it is clear that it must be many times greater than 2 per cent.?—Certainly.

35,716. Can you mention a probable figure?—No.

35,717. Would you think a figure of 40 per cent. excessive?—I have no information. If I gave a figure, it would be purely guess work.

35,718. How much of the gross value goes into the payment of interest? —I do not believe anybody knows at all, even approximately, what the total indebtedness is.

35,719. If anyone made such a statement would it surprise you?—I should ask him where he got the information from.

35,720. You would not accept such a statement without inquiry?—No. I would not venture myself to mention any figure in that connection.

35,721. Is it your argument that the Government cannot finance the cultivator directly?—Yes, it is quite obvious.

35,722. Therefore, in attempting to improve agriculture the only way in which Government can come in is by attempting to control the rate of interest?—Yes. We have got the Usurious Loans Act; we have got the competition of the co-operative credit society. These are the two methods.

35,723. Have any other methods been suggested at any time for controlling the rate of interest?—I am not aware of any.

35,724. *Sir Henry Lawrence*: How long does it take to finish a settlement?—It generally takes about 2½ to three years now. It used to take seven years years before.

35,725. *Sir Thomas Middleton*: Do the papers of the Agricultural Department pass through your Revenue Department?—No. The Agricultural Secretary is Secretary in the Education Department.

35,726. *Raja Sir Rampal Singh*: Do you in normal years distribute *taccavi* for seeds and bullocks?—Yes. The actual figures of *taccavi* for recent years are given in the provincial memorandum.

35,727. Is that for improvement?—No, loans under Act XII are almost entirely for seeds and bullocks. Loans for machinery come under this Act, but not for wells.

35,728. Owing to the hardship which the cultivators have to bear in paying back these *taccavi* loans, would it not be better to distribute *taccavi* through co-operative societies?—I think, from the point of view of Government, what one wants to know is whether the co-operative society is able to pay back its debts. Our experience in the Revenue Department is that so many of these banks go into liquidation. They borrow a *kurk amin* to liquidate their debts, and the Revenue Department pays for the *kurk amin*, and the Co-operative Department takes whatever he can collect. It seems to me that before you undertake to distribute *taccavi* through co-operative societies you have got to be pretty certain of their financial stability.

35,729. What I mean to say is that if such encouragement be given to the co-operative society, money may be advanced to the co-operative society on the joint responsibility of the members, and the members may distribute it among themselves——

The Chairman: So that only the members would get the advantage?

35,730. *Raja Sir Rampal Singh*: Yes. It is a general practice that cultivators who cannot obtain loans from the *mahajans* and other places apply for *taccavi*?—Yes.

35,731. So if some such measure be adopted by Government, I think it will stimulate the co-operative movement a great deal?—Yes, it might.

35,732. I should like to know whether this system of *nazarana* was in force before the Act of 1886 was passed by the Government?—The Oudh Amendment Act?

35,733. Yes. Was *nazarana* taken before that?—Yes, I should say it was.

35,734. Do you think before that more *nazarana* was taken than at present?—I cannot tell.

35,735. Are not the landlords compelled to take this *nazarana* because of the limitation of rent enhancement?—It is one of the reasons. *Nazarana*

takes so many forms, it is difficult to say. *Nazarana* is not merely a premium for rent facilities. It is taken for a lot of other things.

35,736. In your reply to the Questionnaire you say that the number of agricultural wells in the Provinces has increased to 441,000. Does this number include wells constructed by the landlords, or is it only for those wells which have been constructed from the *taccavi* advanced by the Government?—That is the total number of wells.

35,737. So that it includes those wells also which have been built by the landlords?—Yes.

35,738. Is there any statement showing how many wells have been built by the landlords within the last thirty years? Figures are not given separately anywhere?—I do not think there are separate figures showing the wells built by landlords and wells built by tenants. There is no record of that.

35,739. As far as your knowledge goes, do not the landlords build wells in their own villages, or help the tenants to build wells?—Landlords and tenants both build wells. If the tenants have rights in their holdings they do a good deal of well construction. Landlords certainly do quite a lot.

35,740. Is it not a practice in villages, except in some special cases, that the landlords have to give fuel and all other things and to help the cultivator in building these wells?—I believe the landlord very often does help the cultivator in the construction of wells.

35,741. Who reports the wages of the labourers to Government?—They are reported by the District Officer.

35,742. Is there any difference between the wages that prevail in cities as compared with those in villages?—I should certainly think so.

35,743. Is it not a fact that in towns wages are always high, much higher than those prevailing in villages?—I should certainly think so.

35,744. Is there sufficient incentive to the landlords to make improvements in their estates or in their properties?—The chief incentive is the extra profit.

35,745. You give certain concessions at the time of settlement, but not at the time when the construction is made. Is any incentive in this direction given to the landlord?—I do not think any concessions are given, but I do not quite understand what you have in mind. The incentive, I understand, is that if the landlord makes improvements he gets increased profits, and Government does not tax him on the increased value due to the improvement.

35,746. My personal experience as a landlord is that there are times when the landlord finds great difficulty in getting his rent, and has to make certain improvements to maintain the same rent as before. He cannot enhance the rent, and even the old rent could not be maintained without some improvement?—Yes.

35,747. Before the tours of District Officers were curtailed, were the officers in greater touch with the village people than they are now?—They must have been more in touch. The Collector in a big district now does practically no touring at all. His work at headquarters is heavy, and he has no time to spend four or five months a year in camp. In these circumstances he cannot be so much in touch with the agricultural population as he was when he spent four or five months on tour.

35,748. My question is, is it only since the non-co-operation movement that these tours of District Officers have been curtailed? Before that were they more in touch with the village people?—It is inevitable that if they

are not moving about freely among the people they must be less in touch with them.

35,749. Was there not some distrust amongst the villagers about these tours, because they had to suffer much harassment and trouble?—I should say this discontent comes partly from the politician and partly from the Bar. The local Bar does not like the Collector to be out in camp hearing cases, and it does not suit a particular type of political thought. There may have been individual cases in which the touring officer was unpopular, but, generally speaking, I should say the villager very much prefers the Collector to tour more freely.

35,750. *Sir Henry Lawrence*: Is it in the interests of the villagers that the Collector should tour more freely?—Yes.

35,751. In what way?—The Collector by touring gets to hear things personally, he gets a much more intimate knowledge of what is going on, and his knowledge is first hand.

35,752. That is from the Collector's point of view?—Yes.

35,753. From the villager's point of view, in what way does the villager profit by the Collector touring more?—He profits by virtue of the fact that there is much more control over the local petty official and abuses are less likely to happen; and I suppose if the Collector is more intimately acquainted with conditions in the villages, it is more probable that he will further schemes for the improvement of villages and take more interest in the advancement of village life generally.

35,754. *Sir James MacKenna*: It often saves the villager a visit to headquarters?—Yes.

35,755. *The Raja of Parlakimedi*: Complaints are more easily disposed of?—Yes; it is very difficult to put it into language, but the advantages of a close personal touch appear to be clear enough.

35,756. *Raja Sir Rampal Singh*: You say that formerly Collectors used to tour a great deal in rural areas. Were they doing any service to the villagers in those days, helping the villagers in agricultural improvements or hygienic conditions? Of course, they could also exercise more control over the petty officials; but were they rendering any other service?—I think the advantage really lay in the better working of the general administration; I do not say there were any visible signs of sanitation schemes in villages or things of that sort, but I think the welfare and general prosperity of the villager is very closely bound up with the efficiency of the district administration; if the Collector is in close personal touch with what is going on and is able to control the general working of the district by personal contact, the villager is inevitably a good deal better off than if the administration is getting lax and things are generally not so efficiently run.

35,757. Before the reforms were introduced these Collectors had to do a great deal of work in connection with District and Municipal Boards?—They were the chairmen, yes; they were responsible for the general administration of District Boards.

35,758. Now they have been relieved of those duties?—Yes, but that does not mean that the Collectors have ceased to have any work in connection with District and Municipal Boards.

35,759. I should say very little now as compared with those times?—That is a matter of opinion; I have not any personal experience, but one does occasionally hear it stated that the position now is that the Collector is responsible for what is going on in his district; in many ways it was very much easier for him before; being in charge as official chairman did not

really appreciably add to his work as compared with what he has to do now; the work is now much more difficult. You may say that the Collector is no longer the official chairman, and it may sound as if therefore he had no connection with District and Municipal Boards, but I believe the facts are quite otherwise.

35,760. In your statement you say it is now the policy of the Government to take only 2 per cent. of the value of the annual produce. What proportion will it be of the net yield of the Province?—I cannot give you anything more than the figures in the last chapter of this memorandum; the whole thing is worked out there. It varies from district to district.

35,761. What proportion of the net assets did the Government take at the time of summary settlement?—The original percentage of the assets which the Government took, right at the beginning of British rule, was 90 per cent.

35,762. Then after that it began to take a more liberal view?—It came down gradually.

35,763. I have in mind the note of Sir Harcourt Butler; I think the policy of Government has gradually become more and more liberal?—I am quoting from the Report of the Settlement Committee: "The British Government found this percentage of assets unrealisable in practice and it was reduced gradually through succeeding stages. Regulation VII of 1822 fixed it at 83 per cent., Regulation IX of 1833 at two-thirds, and the Saharanpur Rules of 1855 at half the net assets." It has remained theoretically at this level up to the present time, but in fact the percentage of assets taken in the recent settlement has been between 43 and 45 per cent.

35,764. At the time when the summary settlement was made, I believe there was great scope for the cultivation of new lands?—Yes, certainly, when the original settlements were made.

35,765. A very large area has come under cultivation within the last 100 years?—Yes.

35,766. Is there great scope now for more land to be brought under cultivation?—No, there is not a very big scope for extension of cultivation.

35,767. There may be a thousand acres or so in Oudh; there is not much?—No, generally speaking, there is not a great scope for the extension of cultivation in the ordinary districts of the United Provinces.

35,768. Perhaps it may be admitted that all that area was brought under cultivation owing to the exertions of the landlords, possibly because of over-population?—I personally should rather attribute it to the exertions of the tenants, not of the landlords.

35,769. You have been a Settlement Officer; is it not a fact that zamindars have given land and help to tenants?—They have given land, but, of course, they have charged rent for it.

35,770. But have not the landlords given help in founding hamlets?—They do sometimes; it depends whether the landlord is particularly anxious to get fresh tenants or not; it depends how the competition is; in a tract where the competition is for tenants, the landlords will go a long way to get tenants; on the other hand, if the competition is for land and not for tenants, the landlord certainly does not go out of his way; he does not have to go out of his way.

35,771. I believe this competition for land has arisen within the last fifteen or twenty years?—It has certainly become much greater within that period; it varies from district to district according to the population.

35,772. Has any calculation been made as to what ratio the average rent bears to the annual yield of the tenant?—Will you look at tables "G" and

"J" of Chapter XXVI in the Report on Agriculture in the United Provinces; it is all there; that is the only estimate I can give.

35,773. Is it possible to eliminate the moneylender altogether from the village economy; I mean would it be beneficial to agricultural operations?—It depends what you substituted; if you could finance the whole of agriculture at lower rates of interest, it would certainly be beneficial.

35,774. Of course, but as long as such steps are not taken, is the moneylender necessary?—Unless other arrangements are made for financing agriculture, I think the moneylender is a necessary evil; I do not see how you can get rid of him; the cultivator has got to be financed somehow, the money has got to be found, or else the cultivator has got to have more money himself so that he will not want to borrow.

35,775. There must be some special reasons for these moneylenders taking such high rates of interest; I mean that owing to the risk and the excessive litigation expenses, especially at the time of the execution of decrees, moneylenders have to charge high rates in order to compensate themselves for the losses they have to incur. Would it not be justifiable for Government to take steps in that direction with a view to benefiting the cultivators?—To facilitate the execution of decrees and that sort of thing?

35,776. Yes, if possible; it is only a suggestion?—I certainly think there is room for improvement in the method by which decrees are executed.

35,777. *The Chairman*: On this question of the possibility of distributing *taccavi* loans through co-operative organisations, it may be well to bring the matter into its right proportions. Do you know that there were 115,149 members of primary credit societies last year, whereas it is estimated that there are 7,125,000 heads of households in the rural areas?—Yes.

35,778. That is to say, the present membership of the primary societies amounts to about 2·18 per cent. of the total rural population which might conceivably become members?—Yes.

35,779. So that in the meantime the opportunities of meeting the needs for *taccavi* loans through primary societies would seem to be rather limited?—Yes.

(The witness withdrew.)

SARDAR KIRPAL SINGH, Sardar Nagar, Gorakhpur.

Replies to Questionnaire.

QUESTION 2.—*Agricultural Education.*—(i) This is not sufficient. In the United Provinces there is only one college in Cawnpore.

(ii) There are no facilities for agricultural teaching in Gorakhpur.

(iii) Preferably, but we should not confine to agricultural classes alone, we must take the best we could get.

(ix) No career worth the name is open to students.

(xii) This can be popularised by giving lands to deserving students from Government reserves.

QUESTION 3.—*Demonstration and Propaganda.*—(*a*) Personal example set by big zamindars who take interest in the subject.

(*c*) Zamindars should be encouraged to start demonstration farms in each village or in a central village easily accessible to surrounding villages.

(*d*) In our own farm we have made experiments with improved cane varieties and wheat, and both are successful.

QUESTION 4.—*Administration.*—(*c*) (i) No, these are not sufficiently available.

(ii) The present rates on seeds and fertilisers are very excessive and they should be greatly reduced.

(iii) Roads are not sufficient. More *pucca* roads should be built, and no such roads exist in the *mofussil.*

(iv) Forecast report of the department should be more widely circulated in vernaculars of the Province, and, if possible, reports pertaining to districts should be attempted.

QUESTION 5.—*Finance.*—(*a*) *Taccavi* loans should be given for a good breed of cattle, seed and wells.

QUESTION 6.—*Agricultural Indebtedness.*—(*a*) (i) The main cause of borrowing is that when the agriculturist wants money, it is not available, nor can any bank advance money against his standing crops. So he has to go to a petty moneylender.

(ii) Petty moneylenders.

(iii) When the crops fail.

(*c*) The more you restrict, the more evil practices will increase.

QUESTION 7.—*Fragmentation of Holdings.*—(*a*) Holding should not be subdivided beyond 10 *bighas.*

(*b*) Small occupancy holdings and their subdivisions and inherent habit of people against migration.

(*c*) Present law is more than sufficient.

QUESTION 8.—*Irrigation.*—(*a*) (ii) The water of tanks, ponds, *jhils* and rivers should be utilised with the help of pumps.

(iii) The use of tube-wells should be more popularised and larger grants on smaller rates should be granted for this purpose. The present rate of *taccavi* is too high. For small areas *pucca* wells with Persian wheels will be more useful.

QUESTION 9.—*Soils.*—(*a*) Soils become poorer for want of manuring and ignorance of the use of fertilisers.

QUESTION 10.—*Fertilisers*—(*a*) This can be improved by stoppage of the export of bones and oilcakes and oilseeds. By improving cow and buffalo breeds agriculturist will get good bulls as well as food and manure for his field.

(*c*) The use of chemical fertilisers is good to some extent, but it would be beyond the capacity of the cultivators in respect of money, understanding and application.

(*e*) I do not think these manures have been tried thoroughly.

(*f*) Facilities should be given by Forest Department for cheap fuel from Government forest.

QUESTION 11.—*Crops.*—(*a*) (i) Supply of better quality of seed.

(iii) Help of zamindars to be taken for this.

(iv) Bulls and monkeys to be controlled. There should be some fund for the maintenance of the bulls, and old and useless bulls should not be let loose.

QUESTION 12.—*Cultivation.*—(i) No improvement could be suggested unless plough cattle are improved.

(ii) The present rotations are quite enough.

QUESTION 14.—*Implements.*—(*a*) Agricultural implements are too costly, something should be done for local production.

Sardar Kirpal Singh.

QUESTION 15.—*Veterinary.*—(*a*) Better if under the Director of Agriculture, and there will be more co-ordination.

(*b*) (ii) No.

(*c*) (i) No veterinary dispensary worth the name is available.

(ii) Never heard of any such dispensary coming to our place.

(*d*) More veterinary doctors should be available for the district.

(*e*) We never got serum.

QUESTION 16.—*Animal Husbandry.*—(*a*) (i) Better bulls and stoppage of deluge of inferior Brahmini bulls.

(ii) No such industry in Gorakhpur.

(iii) No proper feeding of cattle.

(*b*) (i) No pastures in the district of Gorakhpur.

(iii) Quite insufficient.

QUESTION 17.—*Agricultural Industries.*—(*a*) The men are too busy during the year to find time for anything else.

(*b*) All are engaging in the work.

(*c*) In Gorakhpur for men to touch eggs and fowls is disgusting.

(*d*) Every leaf is used in feeding cattle. Oil, sugar and rice factories should be encouraged.

QUESTION 18.—*Agricultural Labour.*—(*a*) We want our surplus to be provided for elsewhere.

(i) and (ii) None in Gorakhpur worth the name.

Oral Evidence.

35,780. *The Chairman*: Sardar Kirpal Singh, you are from the district of Gorakhpur in the Central Provinces?—Yes.

35,781. We have got the note of the evidence which you have been good enough to prepare for us. Is there anything which you would like to add to that at this stage or may we ask a few questions?—You may ask questions.

35,782. Turning to your note in answer to our Question 2, Agricultural Education, you say, "No career worth the name is open to students." Are you thinking there of a career in the services or of a career in the business of agriculture?—A career in the services.

35,783. Do you think that agricultural education should be regarded as a qualification for practical farming as well as for recruitment in the services?—It should be for practical farming, because students coming out from the colleges do not know much about practical work. They are not of much use on the farm.

35,784. When you say that they are of very little use on the farm, do you speak from personal experience?—Yes. Many a time the students have come to me, and when I put them some questions on farming they say they do not know anything. They do not know anything about practical farming in the fields.

35,785. You mean they have no knowledge of farm management?—Farm management can be achieved after some time; but first they should know how to do the work.

35,786. You mean if you give them a task to supervise they do not know enough to do that?—Yes; they do not know when the plant requires watering and that sort of thing. They may have read a good deal, but when they go actually to the field they do not know how to do the work.

35,787. You think it is the difference between theory and practice?—Yes, a good deal.

35,788. Does that suggest to your mind that agricultural education might be strengthened on the practical side?—Yes, it should be.

35,789. Would you tell the Commission something about the extent of your own holding in land, how much land you own?—I do not own any land, but my father owns land.

35,790. Would you tell us about your father's ownership in land?—In the United Provinces my father has got about 10,000 acres.

35,791. What is the extent of the land which he farms himself?—About 600 acres.

35,792. Does he farm that by paid labour?—Yes.

35,793. Paid in cash or in kind?—Cash.

35,794. Cash entirely?—Yes, entirely cash.

35,795. What wages does he pay?—A new man gets 4 annas a day and the man who stays in the farm for two years gets about 6 to 8 annas.

35,796. Is that, you think, the ordinary market rate for labour in those districts?—Yes.

35,797. I see that on your father's farm you have made experiments on improved cane varieties and wheat; are those two crops the main crops?—In our farm they are the main crops; we also grow gram and rice.

35,798. What wheats do you grow?—Pusa 4 has been found to be the best in our place.

35,799. And canes?—213 Coimbatore.

35,800. How long have you had that on the farm?—For about five or six years.

35,801. Are you satisfied with it?—Yes.

35,802. You see no signs of deterioration either in the wheat or in the sugarcane?—No, not till now.

35,803. Do you manure your wheat land?—Not much.

35,804. When you do manure your wheat land, what fertilisers do you apply?—So far we have applied cowdung.

35,805. Does that give good result in the case of wheat?—Yes. A little bit of green manure is also used.

35,806. Do you give up a certain amount of land to growing green manure crops?—Yes.

35,807. What do you grow?—Sann hemp.

35,808. Are these lands irrigated?—Yes.

35,809. All of them?—Not all; but specially the farm I am talking about.

35,810. You do grow wheat on irrigated land?—Yes.

35,811. Do you grow any fodder for your working cattle?—Not much; but for our own cattle we grow *bajra*.

35,812. Do you preserve it at all against seasons of shortage?—Not much. We find some difficulty only in two months, but in other months it is quite all right.

35,813. Do you keep any milch cows at all?—Yes.

35,814. What do you feed them on in the season of fodder shortage?—I have never experienced any fodder shortage; but we generally feed them on *bhusa*, gram, *arhar* and such other things.

35,815. Have you heard at all of the method of preserving fodder by placing it in a pit and making silage?—Yes; we do it.

35,816. Do you find that a success?—Yes.

35,817. Do you give it only to the milch cows?—We give it also to other cattle.

35,818. To the working cattle?—Yes.

35,819. Do they eat it readily?—Yes.

35,820. For how many years have you been practising that method?—For four or five years.

35,821. You think you are likely to continue it with success?—Yes.

35,822. You keep it below ground?—Yes, below ground.

35,823. On page 232, in answer to our Question 7, Fragmentation of Holdings, you say, "Holding should not be sub-divided beyond 10 *bighas*." Do you suggest that there should be a law passed to that effect?—Yes.

35,824. Do you think that would receive a reasonable body of public support?—Whenever any law is passed there are some who support it and some who oppose it.

35,825. So I say a reasonable body. You do not hold any firm view as to the number of people who would agree and as to the number of people who would object?—I think there would be very few who would object.

35,826. You touch on an important point in answer to our Question 8, Irrigation. You suggest that the present rate of *taccavi* is too high?—Yes.

35,827. Do you think that *taccavi* could be financed by Government at a lower rate of interest than that at present charged?—When a work of irrigation is taken in hand, the interest starts to accumulate immediately, though the tube-well is not finished even in two years after starting boring work; and for these two years the man who takes the loan has to go paying interest for nothing, though he does not use the tube-well at all.

35,828. I am asking you whether, having considered this matter from the lender's point of view, you think that the loans can be financed at a lower rate of interest than at present charged?—If the Imperial Bank can give money at a low rate of interest, why not the Government?

35,829. Why not go to the Imperial Bank for the money then?—The Imperial Bank does not give money for agricultural purposes.

35,830. In answer to our question on veterinary matters on page 233 of your note, you complain that you never get the serum. Have you asked for it at all?—Yes.

35,831. Would you tell us the circumstances in which you asked for it?—Last year I lost 25 or 30 cattle of mine. When the disease broke out I asked the doctor to come and see; he came along and said that serum was required, and he wrote for it and he never got it.

35,832. And he never did give it?—No; he never gave it to me, at any rate.

35,833. Was he the local veterinary officer presiding at the district dispensary?—Yes, at Gorakhpur.

35,834. That was last year?—Yes; he said there was no supply to the dispensary.

35,835. Can you give me the name of the officer?—I do not remember the name.

35,836. Can you let us have that and also other particulars?—Yes.

35,837. Can you give us the name of the dispensary?—There is only one at Gorakphur. I will send you the full particulars later.*

35,838. In answer to our Question 17, Agricultural Industries, you say that the men would not touch eggs and fowls. Is that prejudice universal?—Yes.

35,839. You do not think there is any chance of any caste or class taking up poultry farming?—The *Chamar* classes may take it up.

35,840. In answer to our Question 18, Agricultural Labour, you say: "We want our surplus to be provided for elsewhere." That is to say, you want to import labour; is that the idea?—I want the Government to send the surplus labour that we have in Gorakhpur to Assam, where there is plenty of land.

35,841. You have surplus labour?—Yes.

35,842. Unemployed?—I do not know whether it is unemployed or not. These people come and work on the sugarcane field simply for the sake of the top of the cane.

35,843. For no wage at all?—No.

35,844. Do you happen to know whether there is recruiting for the Assam tea plantations?—I do not think they should go as labourers.

35,845. Your idea is that they should go somewhere and settle?—Yes.

35,846. *Sir Henry Lawrence*: As a matter of fact, do any men go to Assam and settle there?—No; I do not think so.

35,847. There is some emigration from the Gorakhpur district?—Yes.

35,848. That is the most extreme eastern district?—Yes.

35,849. It is the chief recruiting district for Assam?—Yes; but they go as coolies and come back again.

35,850. They do not take their families and settle there?—No; I have never heard of any going and settling there.

35,851. You think that is a good thing that they should be allowed to go there on wages?—I suggest that they should be given lands and made to settle there; it will be a more attractive thing.

35,852. There is no opposition that you know of from the landlords in your district to this emigration?—No; I do not think so.

35,853. There is no objection from any point of view?—I do not think the landlords will have any objection to that.

35,854. Have you heard of any objections put forward either in the Press or in public meetings or anything of that kind?—No, not at all.

35,855. We are told that objections have been put forward?—When these coolies go there under contracts, they are treated badly; but I have never come across any objections.

35,856. That contract system has now been abolished, has it not?—I do not know.

35,857. You state that they are still taken there on indenture?—One man complained to me the other day that his son had gone somewhere and he could get no trace of him. He took a loan from me and went in search of his son, but he has had to return without being able to find him. He applied to the Collector explaining the circumstances and asking that his son should be sent back to him.

35,858. But there is no indenture system in force now, is there?—I do not know.

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* Not received.

35,859. *Sir Ganga Ram*: You have got a sugar factory?—My father has.

35,860. And you grow sugarcane? Do you make sugar direct from the cane or from *gur*?—From both.

35,861. That is to say, when the cane season is over you make your sugar from *gur*?—Yes.

35,862. And you have found Co. 213 quite satisfactory?—Yes.

35,863. I suppose you keep your own seed and do not have to import from Coimbatore?—No.

35,864. Do you find that there is any deterioration in the germinating power of your own seed?—During the last five years I have noticed no such deterioration.

35,865. Do you not require occasionally to import seed from Coimbatore? —I cannot speak about the future, but up to now we have not imported any, except, of course, the quantity which was imported at the very beginning.

35,866. *Sir Henry Lawrence*: That was five years ago?—Yes, about six years ago.

35,867. *Sir Ganga Ram*: And what are the varieties which are recommended by the Agricultural Department? From the evidence before us Co. 213 did not seem to be much in favour? Have you tested any of their varieties?—This variety was the one recommended by the Agricultural Department.

35,868. Barring that, have you tried any other variety?—Yes, 247 Java. We have also tried 48 Shahjahanpur and we have tried Barbados.

35,869. And the Shahjahanpur quality is not as good as this one, is it? —It is very good cane, but on my farm it did not do well.

35,870. Is that a soft cane?—Yes, but it has the habit of lodging, with the result that jackals and wild boar chew it up and destroy it. But Co. 213 does not lodge, and it keeps on for a long time; that is to say, we can crush it in May even without fear of deterioration in purity setting in.

35,871. But what about the softness which enables people to chew it easily?—It is not soft; it is a bit hard.

35,872. Is Shahjahanpur soft?—Yes.

35,873. So that it is not popular with the people because they would find it difficult to chew?—We do not want them to chew our cane, and so we prefer it to be hard.

35,874. You have experience of tube-wells?—Yes.

35,875. As distinct from bored wells? Which is the one with which you are familiar?—We have got a tube well 260 feet deep with a strainer from the top.

35,876. Have you any experience of bored wells?—Yes, that is also doing very well.

35,877. Have you any on your farm?—We tried one well some time back and the result was that we obtained a better supply than before.

35,878. In these tube wells, whose strainer do you put in generally?— The agricultural people do it for me.

35,879. And they give you very easy terms, Government charging some subsidy?—No subsidy is charged. We have to pay for all the labour ourselves.

35,880. Government does not bear any share of the cost?—Perhaps an Engineer is supplied free and probably also tools for boring; nothing else.

35,881. What assistance does Government render in the boring of wells?—We have to pay for all the boring work.

35,882. It is said that if there is a failure, Government stands the loss? Is that true?—I think we have finished four or five tube-wells, of which two were just started with an ordinary oil engine. The scheme is to work all these tube-wells by electricity, and there has been no failure up to now, so I cannot say whether Government will bear the loss in case of failure.

35,883. You get sufficient assistance from Government in regard to advances of money for industrial purposes?—For boring work the Government gives advances.

35,884. Do you get anything for the machinery?—Not for purchasing machinery.

35,885. *Sir Thomas Middleton*: With regard to the question about the fragmentation of holdings, you said in answer to the question whether any more addition to the law was necessary, that the present law is more than sufficient? What do you mean by more than sufficient?—In former days when there was no tendency law the zamindars and tenants lived on very happy and amicable terms. The landlords loved their tenants and the tenants in their turn loved their landlords.

35,886. *The Chairman*: When was this?—When there was no law.

35,887. *Sir Thomas Middleton*: Before there was any law on the point, would the landowner have seen to it that the land was not divided?—There was no possible chance of any division. Whenever the landlord thought the land was being subdivided he simply put a stop to it by ordering the people to go elsewhere. Now that there is this law the zamindar and the tenant are constantly wrangling, the former trying to prevent the latter from becoming an occupancy tenant and the latter trying to become one. This is one of the reasons why holdings are subdivided. If a man has a holding of, say, five acres of land as occupancy holding, and he has five sons, each son wishes to live on his little bit of land and that is how the land is being subdivided.

35,888. In answer to Question 12, you say that there is no chance of improving agriculture unless the plough cattle can be improved?—That is the first thing to be improved because when you have got good cattle the people take milk. When the people take milk they are much stronger in health than they would be otherwise. What do we see in the Gorakhpur district? There you would require ten coolies to do a piece of work whereas it would require only one or two Punjab coolies to do the same piece of work. When they take milk they will naturally become stronger and besides they will have better cattle to plough their land with, and apart from all that, they will have manure for their fields.

35,889. *Sir Thomas Middleton*: If you had an improved breed of cattle would you be able to feed and keep them in good order?—Yes, when we can feed a bad breed I do not see why we cannot feed a better breed.

35,890. But the big breed wants more food than the smaller breed?—No; the Montgomery cows do not want much food.

35,891. You say there are no pastures in your district of Gorakhpur. How do you feed the cattle that you have?—The people go about in the villages and find some green grass which they cut and bring home to feed their cattle.

35,892. But there must be pasture land if there is fine green grass?—No pasture land; the grass is found on the borders of the fields.

35,893. How much land did you say you had?—Ten thousand acres.

35,894. Would it be a practicable thing to convert any of that into pasture land?—Government, I think, should take the lead first instead of asking the zamindar to do so.

35,895. But the zamindar knows what is wrong and he should show the way to improve?—Government has got more land than the zemindar. There are vast areas of forest land, and Government can well spare a portion of that forest land for breeding purposes.

35,896. How many acres would one pair of your plough bullocks cultivate in your district?—We have got a mixture of both plough as well as tractor cultivation.

35,897. If you take the best of your plough bullocks, what area would you cultivate with a pair of bullocks?—One pair of plough bullocks would be quite sufficient for seven acres.

35,898. If you take these country bullocks that you have been criticising, how much do you think they would be fit for?—I have not made any calculation about that. They can only do light ploughing.

35,899. They would do the same area but they would not do as well as your bullocks? They would plough ten acres but they would not do it properly?—Not even that. I do not think they can do the same amount of work that a better breed of bullock can do.

35,900. What I was trying to get at was whether your improved bullocks were cultivating more land and cultivating it better than the others?—Yes, that is the case. Judging from the load which the ordinary bullocks carry, I find that the ordinary bullocks carry a cartload of 15 maunds of sugarcane as compared to a cartload of 30 or 40 maunds which the better type of bullocks carry.

35,901. You say somewhere that you suffer from a deluge of inferior Brahmini bulls?—Yes.

35,902. What is there to prevent these bulls being castrated?—They are Brahmini bulls and cannot be castrated.

35,903. I was told by a witness yesterday that there were a number of inferior bulls in his district and there would be no difficulty in castrating them?

35,904. *The Chairman*: Not Brahmini bulls, I think?—You cannot castrate Brahmini bulls.

35,905. *Sir Thomas Middleton*: Have you any suggestions for dealing with this deluge?—I think the best thing would be for those people who want to have these Brahmini bulls, to collect some money, say, Rs.200 and to get a good breed of bull, instead of going in as they do now for these ordinary inferior bulls.

35,906. *Raja Sir Rampal Singh*: Are there facilities for zemindars to expand their farms or to start new farms under the law?—I think there is no possible chance for the zamindars to start farms.

35,907. Do you think that, taking all the circumstances of the Provinces into consideration, the zamindars are better equipped to start farming on improved lines than others?—They can do much better work, certainly. But now the attention of the zamindar is probably drawn towards that, because everything else has gone. The difficulty however would be perhaps that the zamindars would not get sufficient land to cultivate, themselves, under this new law.

35,908. In the tenancy law there is a provision?—Yes, but I wonder if that provision can be brought into action.

35,909. Because it will be too expensive for the zamindars to take that land? There is a provision that if any zamindar pays four times the rent

of a holding, he can acquire it?—You can never get it. It is only in the law, but you will never perhaps get it.

35,910. Because the Collectors stand in the way?—Always. It all depends upon what sort of man the Collector is; it depends on his will. If he thinks that the zamindar can do the work, he will give sanction, but in the majority of cases it will never be sanctioned.

35,911. As long as we do not get good bulls of good breed, do you not think that the present custom should be allowed to be continued? For improving the breed of the cattle, it is not possible for every village to get one bull from outside for Rs.200 or Rs.300?—It is not very difficult. I have not calculated the figures, but I think in each village four or five bulls every year must be let loose. In the Gorakhpur district the villages are small, perhaps hardly 1¼ miles apart.

35,912. Do you know how many villages there are in Gorakhpur?—No, not in Gorakhpur, but I know my own villages.

35,913. Every village will require four or five bulls?—They do not require so many bulls, but it is the custom that they follow.

35,914. One bull will be quite enough for a village?—Yes, quite enough.

35,915. One bull will be enough to cover the cows in the village?—I think so.

35,916. *The Raja of Parlakimedi*: On your farm, what sort of labourers do you engage? Are they all paid labourers?—There are paid labourers as well as people who live round about in our own villages. They have got land. One member of the family looks after the land, but the others come to the farms in the neighbourhood.

35,917. Are they all like that?—No; they are mostly paid labourers.

35,918. How many permanent hands do you have? You must reduce or increase the numbers according to the requirements of the season?—Yes.

35,919. Throughout the year do you not maintain a certain number of permanent servants?—We have arranged that they should always work for the people throughout the year. If they are working on sugarcane at one time, at other times they must be doing some other work. Once a man goes away, you will never get him back, and we lose the money spent in teaching and training him.

35,920. Are they fully occupied throughout the year?—Practically for the whole year.

35,921. During the slack hours, have you introduced any home industries, like rope-twisting, to keep them engaged?—I have not introduced rope-twisting, but we have got a sugar factory, and that and the farm are joined together.

35,922. For their requirements, do you lend money also?—Yes.

35,923. Do you advance it on their pay?—I advance money.

35,924. In what proportion?—It all depends upon the necessities of the man; one has to judge.

35,925. If a labourer of yours was drawing Rs.20, how much would you advance him?—Advance for a month or advance for the year?

35,926. How much would you advance him as a lump sum?—Rs.10 or Rs.15; that has to be given to him in the very beginning of the season.

35,927. You pay in advance?—Yes. He goes on drawing up to half his pay. If he wants any advance, he can draw up to half his wages, and at the end of the season he has to clear up the whole account.

35,928. Apart from that, do you advance any money for marriages and other requirements?—He sometimes comes and asks for money for a marriage; sometimes he says he wants money for purchasing bulls or calves.

35,929. Or to repair his house?—Yes, all sorts of things.

35,930. What is the rate of interest you charge?—It is 9 or 10 per cent.

35,931. In what instalments do you recover it?—If the crop is good, he pays back. It is only very few who do not pay back; most of the people pay back themselves.

35,932. You do not press for payment very often?—No; they pay back.

35,933. Have you not found any difficulty in recovering?—Not much. There are a few who will take the money and go away, and you will never see them again, but the majority are not like that.

35,934. In your sugarcane cultivation, are you carrying on the ratoon system of cultivation?—Yes.

35,935. To what extent?—One year only.

35,936. What is your present area under cane?—Just now it must be something like 200 to 300 acres.

35,937. Is it all irrigated?—Mostly irrigated.

35,938. Do you irrigate by tube-wells?—By tube-wells and pumps.

35,939. As regards the outturn of *gur* and sugar, which pays better, the irrigated or the unirrigated?—I have not calculated it separately; we do not get any chance of testing, separately, irrigated and unirrigated canes, as they all come along at one time.

35,940. You manufacture sugar also?—Yes.

35,941. What is your outturn per year?—It all depends on the crop, how much you crush.

35,942. You have been carrying on this industry for some time. What will it be on an average?—About 80,000 maunds of sugar.

35,943. What is the capacity of the mill?—400 to 600 tons of cane per day.

35,944. Have you been able to work it to its maximum capacity?—We have crushed 400 tons per day.

35,945. What sort of sugar do you produce?—It is white sugar.

35,946. It is bleached white?—Yes, it is absolutely white.

35,947. What methods of bleaching do you adopt?—We have got our own process.

35,948. I do not want to get at your secrets?—There is no secret at all. The process has been patented.

35,949. There is no difficulty in marketing that variety?—No, none at all.

35,950. Do you make most of your sugar in bleached form?—There are two qualities, No. 1 and No. 2; No. 1 is absolutely white; No. 2 is slightly yellow.

35,951. How much of each do you produce?—It is in the proportion of 2 to 1; two of No. 1 quality and one of No. 2 quality.

35,952. Which has the better market?—Both have a good market.

35,953. Do you have to sell it at a long distance from your place, or can you sell it near by?—There is no consumption near by. I have to send it all along to this side.

35,954. Is it in crystallised form?—It is both powder and crystals. It depends on the market. Some people require crushed sugar and some people require crystal sugar. We supply what they want.

35,955. Have you been experimenting upon the effects of manure on sugar?—Not much.

35,956. Do you simply use the farmyard manure?—Yes.

35,957. *Sir James MacKenna*: You are both a farmer and a sugar manufacturer. Have you had any agricultural training?—No, I have had no agricultural training.

35,958. Except what you learnt?—I think zamindars are born agriculturists.

35,959. Have you had any engineering training?—None.

35,960. You picked that up too?—My brother picked it up.

35,961. He is an engineer?—Yes.

35,962. Does he do the engineering of the sugar factory?—Yes.

35,963. How long have you had this factory?—When you were on the Sugar Committee you must have seen it; it was a very small thing at that time. My father started it in 1913 or 1914.

35,964. How many days in the year do you work the sugar factory?—On the average 90 to 100 days.

35,965. That is with cane and with *gur*?—Not with *gur;* it is only for the cane.

35,966. You get 100 days' cane crushing?—Yes.

35,967. Where does the cane come from, apart from your own?—It comes from many places near by.

35,968. Does it come up on the railway?—Not much.

35,969. All from round about, and carted in perhaps?—Yes.

35,970. What rate are you paying this year for cane?—Seven annas.

35,971. Is the factory paying?—It is paying.

35,972. What allowance do you make for depreciation? Do you strike an annual balance sheet for the factory alone?—We allow depreciation, but accounts are amalgamated with estate accounts and no separate balance sheet is prepared.

35,973. With the general revenues?—It has been like that.

35,974. *The Raja of Parlakimedi*: You do not work it separately?—No.

35,975. *Sir James MacKenna*: You do not keep a separate account?—There is a separate account, but we do not work it separately.

35,976. It goes into the general revenues?—Yes.

35,977. I suppose you do make an allowance for depreciation?—Yes, 7 per cent.

35,978. *Professor Gangulee*: Are the small cultivators in your neighbourhood growing sugarcane?—Yes.

35,979. And you buy their sugarcane?—Yes.

35,980. What varieties are they growing?—Now they are all taking to Co. 213.

35,981. Are the small cultivators taking to Co. 213?—Yes.

35,982. Do they get the seed from you or from the Department?—They get the seed from me.

35,983. You talk about the use of chemical fertilisers. Have you yourself been using any?—We have tried a little bit of it on our farm, but we did not like it.

35,984. What chemical fertiliser did you try?—Ammonium phosphate, ammonium nitrate and ammonium sulphate.

35,985. You had no success?—We did not notice any.

35,986. I understand that Gorakhpur is a big recruiting centre for labour for the Assam tea gardens. Do many coolies come back and settle down in Gorakhpur?—Some who have some interest here come back and some who get a holding there do not come back.

35,987. Some of them do come back?—Some do come back, some do not.

35,988. How do they engage themselves after their return?—They come back, and they go about working in other factories and in their own holdings. Some of them have got their own land. They probably learn something while in the tea gardens, and they do something when they come back.

35,989. Do you know any labourers who have come back from Assam?—There are many people in my own place. Some of them have come back even from Cuba.

35,990. Do you find any change in the standard of living of the man who has come back from Assam?—No.

35,991. How many sugar factories are there in the United Provinces?—Do you mean for sugar or for *gur*?

35,992. To get sugar from cane?—There is one at Rosa, there is another at Tamkoi, then our own, Gaghauli, Padraunalia, Partabgarh and Pilibhit.

35,993. In all about six or seven?—Yes.

35,994. Of these how many are run by the zamindars?—Three.

35,995. Three are owned by the zamindar class?—Yes.

35,996. Do you think there is more scope for sugar manufacture in the United Provinces?—I think so.

35,997. Why do not the zamindar class as a class come forward?—I think they are coming forward. First of all, the impression was that Indians could not work a sugar factory. It was thought it was a very complicated thing. Now that some zamindars have started the others think: "They are just the same as we are. If they can work it, why cannot we?" We started our factory first, and, seeing us, Padraunalia started.

35,998. So that shows that once the lead is given the zamindar class can take up on a large scale industries like sugar manufacture?—Yes.

35,999. Is there a tendency among the zamindars to use improved methods of cultivation and implements and machinery?—I think a number of the zamindars have started using them.

36,000 How many tractors have you seen on the zamindars' own farms?—We are doing our work with tractors.

36,001. Any others?—No others in Gorakhpur up till now.

36,002. What other improved methods have you observed that the zamindars follow?—You mean in cultivation?

36,003. Yes, cultivation and other things?—They have taken up this sugar cultivation, they are using improved varieties of wheat, they are putting in tube wells, and so on.

36,004. That is done even by the smaller proprietors? I mean something which the smaller proprietor does not do and cannot do, but which the zemindar is doing?—You can take our own example.

36,005. Is there no distinctive tendency to adopt new and improved methods by the bigger zamindars?—I think there is. The zamindars are waking up. Every week two or three inquiries come to me as to what we are doing, and how they should start.

36,006. So that you think the outlook is hopeful, so far as the zamindar class is concerned?—Improved methods are being followed, but the difficulty is to get the land.

36,007. Is there a difficulty about land, or is it the difficulty of private enterprise?—I think the difficulty is about getting land.

36,008. Do you think the zamindar class is kept back by the difficulty of getting land and not by its conservative mentality?—No, not by the latter. They have been doing very good work. They simply wait to see the result of what the others do. Once a zamindar starts something, all the other zamindars will take it up.

36,009. *Sir Ganga Ram*: What is the duty against Java sugar?—It is 15 per cent.

36,010. With that advantage how is it that you cannot compete with Java?—The reason is that sugar is being smuggled into India a good deal. It is coming in by smuggling and is being sold at a much lower rate than the Calcutta or Bombay people can sell.

36,011. But still you cannot compete with Java sugar with all the facilities at your disposal?—When land is given to the factories then they will be able to compete with any outside industry. When you have got your own land and cultivate it yourself and get absolutely fresh cane from your own fields, then you can compete with outside industry. At present we have to buy our stuff and rail it from distant places. The quickest you can crush with outside cane is five or six days, and it deteriorates a great deal.

36,012. How do you clarify your sugarcane? Do you use bone charcoal?—No. We use lime and sulphur.

36,013. Does not the Cawnpore sugar factory use it?—No, it is a *gur* factory.

36,014. But it has to be clarified just the same?—They use lime for clarifying.

36,015. *Sir Thomas Middleton*: What is the average yield of sugarcane from your land?—Last year, on the average, we got 936 maunds per acre. Mr. Clarke sent me a man to cut a portion, which gave a figure of 1,146 per acre.

36,016. What area have you under sugarcane this year?—About 300 acres.

36,017. And you are getting that yield from 300 acres?—Last year it was about 200 acres and that was the average from sown cane. The ratoon crop gave us on the average 600 maunds per acre. This year's result is yet to be seen.

36,018. *Sir Henry Lawrence*: How much of that is Coimbatore 213?—The whole of it.

(The witness withdrew.)

The Honourable Mr. SHYAM BIHARI MISRA, Member, Council of State and Registrar, Co-operative Societies (on leave), Lucknow.

Replies to the Questionnaire.

QUESTION 2.—*Agricultural Education.*—(i) No; teachers of agriculture should be provided in all rural schools as far as possible, and certainly in all vernacular middle schools, as well as in those Anglo-vernacular schools where a demand may be found to exist. I think there should be very little literary instruction in rural schools beyond the three R's; agricultural training should predominate there, together with industrial training also.

(ii) This should be done throughout the Province, specially in rural areas.

(iii) At least a sufficient number of lessons on agriculture and co-operation should be inserted in the textbooks of all vernacular schools and up

to class VIII of Anglo-vernacular schools. Also a special class on agriculture should be added to each vernacular middle school.

(x) By giving facilities for starting big farms by youths trained in agriculture, and financing the running of such farms at very low rates of interest (say 4 per cent. for the first five years, 5 per cent. during the next quinqennium, and then 6 per cent. so long as necessary). The security demanded should not be strict. I am sure the adoption of this course will perceptibly reduce unemployment and discontent among the educated middle classes.

(xii) By providing free night schools, part-time schools and off-season schools. The part-time schools should work in the forenoon as well as in the afternoon, but different sets of students should attend them on the two occasions.

(xiii) The administration may vest in Local Boards (District or Municipal), but Government should finance the scheme by levying an education cess and supplementing it by a 50 per cent. contribution from the public exchequer.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Purely demonstration farms alone can be, and have to some extent been, successful, if run as business concerns on self-supporting lines. I fear many people doubt the truth of the claim of financial success of our demonstration farms. If the claim is really correct, as I expect it must be, there should be nothing to prevent an indefinite and extensive multiplication of such farms as early as practicable, till each village can boast of such a farm. We should begin by starting one such farm at the headquarters of each district, tahsil, *pargana*, and at each *thana*, vernacular school and agricultural co-operative primary society. The development of sugarcane cultivation in the Hardoi district is said to be mainly due to this source.

(*b*) Cultivators selected for the purpose should be trained at these farms on payment of moderate wages to them, say Rs.5 per month each, while every one interested in agriculture should have free and easy access to the farms so as to profit by their working.

(*c*) Cultivators, and others interested in agriculture should be given the fullest facilities to study the working of demonstration farms actually run at a profit.

QUESTION 4.—ADMINISTRATION.—(*a*) The Government of India may issue a series of agricultural primers and readers incorporating all useful information about improved agriculture, and also an All-India Agricultural Journal dealing with up-to-date inventions and discoveries which tend to improve and develop agriculture. All these may be issued in English, while Local Governments may issue their translations in the principal vernaculars of their own Province.

QUESTION 5.—FINANCE.—(*a*) The multiplication of promising co-operative societies and the formation of at least a few land mortgage banks. Steps should also be taken to reduce the rates of interest on which co-operative societies can advance loans to their members; the present rates (12 to 15 per cent.) are too high and they may reasonably go down to, say, 9 per cent. per annum, by Government taking upon themselves the responsibility of incurring all cost on co-operative education and supervision, and distributing *taccavi* through co-operative societies.

(*b*) *Taccavi* should be distributed freely through co-operative societies (primary), steps being taken to see that the money reaches individual members at not more than 1 or 1¼ per cent. over and above the rate of interest charged by Government from the societies. There is no need to bring the Central Banks at all into his scheme.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The precariousness of the harvest, and the poverty and improvidence of the ryot.

(ii) Mostly the *mahajan* (village moneylender) and to some extent other sources (as co-operative societies, *taccavi*, etc.).

(iii) Bad harvests, inefficiency and improvidence of the cultivators; also their innate habit of unpunctuality and a desire to postpone payment as much as possible.

(*b*) All the recommendations made throughout my note are of course intended to serve the purpose of lightening the agriculturists' burden of debt and to improve their general condition. I am not in favour of rigidity in enforcing such laws as the Usurious Loans Act, the Insolvency Act, and those limiting the right of mortgage, sale, etc., as they often tend to defeat their own purpose and unduly restrict the credit of those concerned and even the value of their property, but interest at a rate of over double the rates at which co-operative societies advance loans to individual members may well be declared usurious and be discouraged. The development of promising co-operative societies should be encouraged, in spite of the unnecessarily sweeping condemnation of the movement in the United Provinces by the Oakden Committee* of which I was a member. Paragraph 9 of the Committee's Report is worthy of consideration.

(*c*) *Vide* the above reply under (*b*) The Dewan of an Indian State told me that he had practically to guarantee *mahajani* loans in a *pargana* of the State, as he found that cultivation was likely to be seriously crippled if the *mahajans* were to withhold loans.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Consolidation of holdings, as far as found practicable in different areas, appears to be the only remedy. I enclose a copy of my own "Report on the Consolidation of Agricultural Holdings,"† with the United Provinces Government's Resolution† dated 27th May, 1924, thereon for the Commission's consideration; I venture to invite their special attention to paragraphs 1, 2, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 34, 35 and 36 of the Report.

(*b*) Incompact partitions of zamindari rights constitute the chief obstacle. There are also other difficulties as detailed in my aforesaid Report† (copy enclosed), such as succession, alienation of landed interest, separation of joint families, sub-letting, ejectment and the like (*see* paragraphs 17 to 20 of my Report).

(*c*) I can only refer the Commissioners to my Report referred to above.

QUESTION 9.—SOILS.—(*a*) (i), (ii) and (iii).—Government should take steps to reclaim and improve soils and waste lands, where practicable, provided the landlords concerned agree to pay 50 per cent. of the cost, at least in cases of success. Enhanced revenue will enable the Government to recoup its expenses in due course.

(*c*) As above. It may also be perfectly feasible to remit land revenue, wholly or partially, for a number of years.

QUESTION 10.—FERTILISERS.—(*a*) I think natural manures have a greater chance of being generally resorted to at present, but artificial fertilisers should by no means be neglected. Re-afforestation should be encouraged, in the interest alike of meteorological conditions and of providing fuel in order to prevent the extensive use of cowdung as fuel and to facilitate its use as a fertiliser. The export of bones should be prohibited, and steps should be taken to popularise the use of bone manure.

(*c*) New and improved fertilisers should be made easily available to villagers

(*f*) See my answer to (*a*) above.

* Report of the Co-operative Committee of the United Provinces of Agra and Oudh, 1926.

† Not printed.

QUESTION 11.—CROPS.—(*a*) (iii) Improved seeds should be made more easily available to villagers and the punctuality of supplies guaranteed.

(iv) Licences to possess guns for agricultural purposes should be given for the mere asking, provided the demand is genuine and the applicant bears a good character.

QUESTION 14.—IMPLEMENTS.—(*b*) Improved agricultural implements should be used in demonstration farms and they should be made easily available to those requiring them. They should not be very costly or very complicated, and they must be locally repairable.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) The average cultivator works on his holding from July to December and from the middle of March to the end of May, i.e., for nearly 8½ months every year. In the slack season, some work as labourers, others ply bullock carts or ponies, yet others make ropes, etc., while the rest are either idle or do other work.

(*b*) It is very necessary to help the introduction of as many cottage industries in each locality as possible, such as spinning, weaving, fruit growing, starting small factories (for hulling rice, extracting oil, etc.); demonstrations may be given at suitable centres to enable the villagers to imitate them. Serious efforts should be made to relieve the present excessive pressure on land.

(*c*) Ignorance and orthodoxy stand in the way of the adoption of several industries. Supply of information and demonstration of the utility of such industries would remove the obstacles in their way.

(*d*) Certainly; very little is possible without giving demonstrations of the success of anything new.

(*g*) *Vide* (*a*) and (*b*) above.

QUESTION 19.—FORESTS.—(*b*) Re-afforestation, as suggested under Question 10 (*a*) would automatically improve the supply of firewood as well as fodder in rural areas and elsewhere. The growing of suitable fodder crops should also be demonstrated on the Government farms.

QUESTION 20.—MARKETING.—Most of the agricultural produce passes from the producer to the consumer through several middlemen including the village *bania*, the transport agent, the city broker, in many cases another set of transport agents and a second set of village *banias* in the country or the big exporter who exports overseas. Co-operation, when adequately developed, should help the grower to eliminate most, if not at all, of the middlemen.

QUESTION 22.—CO-OPERATION.—(*a*) (i) Government may reasonably be expected to undertake most, if not all of the expenses connected with supervision and co-operative education.

(ii) Non-officials should help their lower class and humble brethren in making primary societies, which really constitute the backbone of co-operation, living organisms standing on their own legs as early as possible. Slight temptations of petty power and patronage should not make them callous to the pressing requirements of the dumb, ignorant and toiling millions of their unfortunate brethren whose vital interests the co-operative movement is intended to serve. I consider it essential that the powers of central societies, which are at present absolutely excessive, should be reduced to the barest necessity, and those of the primary societies should be increased proportionately, steps being simultaneously taken to ensure regular repayment of the former's dues by the latter, with the utmost possible punctuality. In particular, the executive services (such as supervisors, organisers and group secretaries) should be totally detached from central societies. The cadre of supervisors and organisers should be provincialised under a provincial co-operative committee, and group secretaries, where they cannot be done away with and replaced by local secre-

taries, should be made real servants of the primary societies which should pay their quota of the secretaries' salaries direct to them.

Detailed recommendations will be found in the Oakden Committee's Report (published by the United Provinces Government), with which I generally agree, except that I consider several remarks and suggestions therein not only much exaggerated but actually wrong.

(b) *Vide* (a) (ii) above.

(c) Not at present; I agree with Mr. Kharegat's note on the subject, already submitted to the Commissioners, but in cases of serious importance only.

(d) Not to a satisfactory extent, but please see paragraph 9 of the Oakden Committee's Report referred to under (a) above.

QUESTION 23.—GENERAL EDUCATION.—(a) Elementary education must increase considerably in order to make our masses better agriculturists. Serious efforts should be made to raise the ratio of literate people to a respectable figure, say 90 per cent. of males and about 75 per cent. of the total population in the near future. Then and then only can there be a real improvement in agriculture as well as co-operation, the greatest handmaid of agriculture. An increase in higher education is also desirable from the agricultural point of view as well, but it is not so essential.

(b) (i) Please see my answer to Question 2 (1). Also, elementary education should be declared free and compulsory, perhaps for the male children only at present, in as many districts as possible.

(ii) Compulsory education has not made any perceptible headway in rural areas so far, and indeed there is a strong dislike of and even opposition to it in many places, but I am deliberately of the opinion that it is bound to succeed in due course, much earlier than many people imagine, if carried on with zeal and determination.

(iii) The explanation will be found in the poverty and ignorance of the masses.

QUESTION 24.—ATTRACTING CAPITAL.—(a) Multiply indefinitely the number of self-supporting demonstration farms, giving facilities of learning practical agriculture there to all interested in it, and facilitate the starting and maintenance of big farms of say 50 to 100 acres and even more. Also, encourage the ready availability of easily manageable and locally repairable but improved implements of husbandry which, however, must not be very costly or complicated. The adoption of these and similar measures to encourage attractive agriculture and industries would reduce unemployment among the educated middle classes perceptibly, and also wean impatient idealists from violent politics and terrorist tendencies.

(b) The greatest factor is the fear of early enhancement of land revenue.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(a) A fixed proportion of the land revenue and income tax raised from each village, say 10 per cent., may be set apart and ear-marked for effecting hygienic, educational, agricultural and general improvements, to be effected in the village concerned through the agency of the village panchayat under the supervision of the District Board. This allotment must, of course, be over and above the ordinary expenditure at present incurred on these objects by the Government or any local authority.

I am also of the opinion that a Development Board should be constituted in every Province, to co-ordinate the activities of the nation-building departments, such as Education, Agriculture, Industries, Co-operation and Sanitation. It should be presided over by a Minister and consist of heads of the departments concerned, with other officials and non-officials as members; it should meet at least twice every year.

(*b*) I am not in favour of conducting any economic surveys, etc., as they are likely to prove costly and more or less valueless luxuries; the facts ascertained are also not likely to be accurate.

(*c*) I did carry out some inquiries in this line during the course of my special duty on consolidation of agricultural holdings in 1921-22. The broad conclusion reached by me was that economic conditions were slightly improving gradually though the masses even now live almost from hand to mouth. Also, I do not consider agricultural indebtedness to be excessive, but it is certainly considerable and weighs heavily on say 25 per cent. of the rural population.

Oral Evidence.

36,019. *The Chairman*: Mr. Misra, are you a member of the Council of State?—Yes.

36,020. And you are Registrar of Co-operative Societies?—Yes, but I am on leave at present.

36,021. Are you still Registrar of Co-operative Societies?—I am, technically. I have not been reverted.

36,022. I think your successor has only recently taken over responsibility?—He took over only two months ago.

36,023. And it was for this reason that it was thought better that you should represent the Department's views?—Government asked me to appear.

36,024. We have your note of the evidence. Is there anything you would like to add to that?—Nothing; whatever views I wish to place before this Commission are in my note. I have nothing to add to it.

36,025. We are obliged to you for the trouble you have taken, and I will examine you on those notes and on some of the statements presented to the Commission in Chapter XVI of the Report on Agriculture in the United Provinces. For how long were you Registrar?—For just over two years, and before that I was Deputy Registrar for two years, so that I have put in four years and two or three months in the Co-operative Department.

36,026. Have you read chapter XVI? Did you prepare it?—I sent in a note, and I expect it has been prepared in the Secretariat from that.

36,027. Do you regard the movement in this Province as being in a healthy condition?—It is not as good yet as should be expected, but I do not consider it is so bad as it has been assumed to be in some quarters.

36,028. I want to get at the facts about your central credit associations. Have you any Provincial or Apex Bank?—None.

36,029. How many district banks have you got?—36, I think. We have 28 central banks, eight banking unions, two guaranteeing unions, and two non-credit central societies.

36,030. I understand that the difference between your District Banks and your Central Banks is rather difficult to define?—The District Bank is a Central Bank at the headquarters of a district. Their functions are the same, except that some of the smaller Central Banks are affiliated to the District Banks, but the others are quite independent.

36,031. Their function is the same?—Yes, exactly the same, except that some of the smaller ones, as I say, are attached to the District Banks.

36,032. From where do these District and Central Banks derive their capital?—Mostly from shares and deposits.

36,033. Have they issued any mortgages?—No, simply preference shares and ordinary shares.

36,034. Have they issued any debentures, secured on mortgages, I mean?—One or two banks have, I think, but very few of them on the whole.

36,035. Then your Banking Unions differ from the District and Central Banks in that they have no individual members?—They have no individual members, but only society members.

36,036. How do they get their capital?—From the share-money of societies and deposits of the public. Their reserve is gradually increasing also.

36,037. Have the Central Banks or the Banking Unions borrowed money from any other banking concern?—Many of them have. They borrow from joint stock banks, and also there is inter-lending among the various Central and District Banks.

36,038. Can you tell me whether the Report of the Oakden Committee provides information as to the extent to which your Central Banks and Banking Unions have borrowed from Central and other banks?—I do not think it gives all the facts. It only suggested what appeared to it to be improvements.

36,039. Are you sure that these facts are fully known in your office?—I have given almost all of them in my annual report.

36,040. You think that is complete in that respect?—Yes.

36,041. Then I will not question you further about it, if the facts are available?—They are.

36,042. Now the Report on Agriculture in the United Provinces (para. 365) tells us that it is the duty of the Central Banks that we have been discussing to organise and supervise the primary societies as well as to finance them?—It seems to me that they have not been discharging the first two of these duties properly.

36,043. The Report tells us that it is the duty of these central credit societies to organise and supervise the primary societies as well as to finance them, but they have not discharged this duty adequately. First, on the point of principle, do you think it is a sound principle that your Central Banks should be expected to manage your primary societies?—I entirely disagree; I think they should not.

36,044. Would you agree that the usefulness and health of the movement depend more upon the primary society and the capacity of the members to understand, if not to manage, their own affairs, than anything else?—Yes, I think the primary societies are the real co-operative societies; I regard the Central Banks as being more or less what are known as middlemen; they should be nothing but financing bodies; they should have nothing to do with control, organisation or supervision.

36,045. *Professor Gangulee*: That is to say, all executive services should be completely detached from the central institutions?—Yes, that is what was recommended in the Report of the Oakden Committee, and I entirely agree.

36,046. *The Chairman*: What about the disposition of liquid resources at the disposal of the movement? Has that been concentrated in the Central Banks?—Yes, entirely.

36,047. Have primary societies kept any liquid resources in their own hands?—No, nothing whatever.

36,048. On the point of principle, do you think that is sound?—I think it is sound; I do not think it would be proper to keep the money actually in villages; it would not be safe; when it is idle it had better be kept in a safer place.

36,049. You would not like to see liquid assets of primary societies utilised to make further loans by those societies to their members?—No, I do not think so.

36,050. You follow what I mean?—Yes, I do. As a matter of fact, liquid assets are utilised by the Central Banks in this way: most of the liquid

assets are invested in Government promissory notes, in cash certificates, deposited in some other safe bank or with an approved banker if considered quite safe and reliable; the return that they bring in is naturally small, but they remain liquid assets.

36,051. You do not think it would pay a primary society better to lend its liquid assets to its members than to transfer these to the Central Bank and borrow again?—No; the primary societies are not supposed to keep liquid assets, and they seldom do so; they only keep their reserve capital, and even that is not actually kept with the primary society itself; the money is usually kept by the Central Banks, mostly invested as stated, and I think that is a right practice.

36,052. Do you attach importance to the agricultural non-credit primary societies?—Yes, I do.

36,053. What work are they doing?—They are supplying improved seed, implements, &c., and some are stores; these are non-credit activities of the movement.

36,054. At the close of the year 1924-25 non-credit societies numbered six. One cattle breeding and two *ghi* societies had had to be closed in the preceding year because they were doing no work?—Yes.

36,055. The six societies comprised three dairies, one cattle insurance, one *ghi* and one agricultural supply?—Yes.

36,056. Then the report goes on to say: "but none of them, except one of the dairies, was doing any business, and it was considered not unlikely that five would soon have to be wound up"?—Yes, most non-credit societies are not doing well.

36,057. Is it the policy of the Government at the moment rather to concentrate on a revivifying of the credit movement than an extension of the non-credit societies?—I do not think so; I think it is the policy of Government to revivify anything that can be revivified with a fair prospect of success, but somehow non-credit societies are not flourishing in the Province.

36,058. You yourself point out in your note that the movement has rendered valuable service to the cultivators?—I certainly think so.

36,059. But unfortunately the figures of capital afforded have to be read in the light of the present position of the primary societies; I see that in 1924-25 134, and in 1923-24 135 societies were finally wound up?—Yes. It is our policy to wind up any societies which are proved to be inefficient or not working properly if they are also not expected to work properly; we do not want to keep societies merely for show.

36,060. And I see that pursuing that policy, no fewer than 794 societies were in course of liquidation at the close of 1924-25?—That is so.

36,061. Was that increase from 135 to 794 due to some particular action on your part as Registrar, or of your office?—No, it is not such a sudden increase; these figures are cumulative. It is not an increase from 135 to 794; they are accumulating gradually. In fact, the number of liquidated societies is gradually going down rather than up.

36,062. This had better be corrected if it is wrong. Will you look at page 78, paragraph 370, of the Report on Agriculture which I will read in full: "In 1924-25 134, and in 1923-24 135 societies were finally wound up." Are those figures correct?—Yes.

36,063. That is to say, 134 *plus* 135?—134 in one year and 135 in the other year.

36,064. "Besides this, no fewer than 794 societies were in course of liquidation at the close of 1924-25"?—Including those from previous years.

36,065. Apart from the 134 and the 135?—No; the total number in course of liquidation, now, at the end of 1925-26 is 826; liquidation proceedings with regard to some of them have been going on for 10, 12 and even 15 years, I am sorry to say; but the total cumulative balance is now 826.

36,066. We must be able to interpret the memorandum that has been provided for us accurately; can you or can you not tell me whether the 794 societies mentioned as being in course of liquidation at the close of 1924-25 are in addition to the 135 finally wound up in 1923-24 and the 134 in 1924-25?—I expect the figures must be right.

36,067. Then, would you let us know definitely, as representing your department before the Commission, whether that interpretation of those words is correct?—Yes.

36,068. Will you give the Commission an account of your methods of liquidation here? Who acts as liquidator?—An official or a non-official is appointed by the Registrar as liquidator; the Registrar has power to appoint anybody willing to work as liquidator, but it is usually either the Circle Officer or the paid manager of the bank.

36,069. Will you describe the functions of a Circle Officer in this Province so that we may understand?—The department consists of a Registrar, one Deputy Registrar, two Assistant Registrars and 27 Inspectors. These Inspectors perform various duties, but some of them are in charge of circles, and they are called Circle Officers; they are paid from Rs.140 to Rs.240 per month; they are in charge of from one to six districts at present. They generally act as liquidators, but if they have too much other work to do, we sometimes appoint the paid manager of the Central Bank concerned or some other official or non-official.

36,070. Do you ever appoint pleaders as liquidators?—Yes, we have done so; we may appoint anyone who is willing and whom the Registrar considers competent.

36,071. *Professor Gangulee*: How many Circle Officers have you?—At present we have 27 Inspectors; most of them are Circle Officers; two or three are not.

36,072. *The Chairman*: Now I want to draw your attention to paragraph 371 of the provincial memorandum, because it is necessary to have both sides of the picture on our notes. This follows on the paragraph dealing with the statement of the number of societies in liquidation, and it reads: "The above, however, is probably not all; there is only too good reason to believe that the spirit of many of these societies is wrong. It is of the essence of the movement that every member of a co-operative society should understand the principal canons of his creed. Technicalities he can dispense with, but the broad principles he must understand; only so will he be able to check the working of his society and to watch its direction by whatever managing committee is appointed. It is to be feared that but few members of the societies of this Province possess these qualifications. The average member is illiterate and totally unversed in co-operation lore; he understands by co-operation little more than a dignified form of lending and borrowing. He seldom takes interest in the administration of his society, which falls in consequence only too often into the hands of the permanent official or secretary, who alone understands it. That this description is not exaggerated can be seen clearly from the recent discoveries of corruption and neglect in several societies; when supervision of members is slack, management generally tends to become corrupt. Malpractices were found to have been committed again and again in the series of societies, 159 in all, which it has recently been necessary to liquidate in the Budaun district, and in others in Sultanpur and Benares, and more than one managing director

has had to be prosecuted for dishonest practices. Such happenings point unmistakably to want of interest and lack of supervision on the part of members, amounting to a negation of the true spirit of co-operation. To quote the words of the committee referred to in section 374 below:— 'Judged by the conditions laid down by the Maclagan Committee, most of the primary societies of the Province are, as co-operative societies, a sham.' This conclusion may seem harsh, but its substantial truth can, unfortunately, not be gainsaid." Does that, in your view, represent a fair description of the movement?—In my opinion, this is a bit exaggerated. I do not claim that societies are generally in a good condition, but I certainly repudiate that they are merely a sham; I am not prepared to go so far as that. I have seen societies with my own eyes, and I have examined them. It is there that some members do know what co-operation is.

36,073. Would you kindly give the Commission an account of the method of audit?—We have now got here 52 Auditors.

36,074. All in one grade?—No; the grades are: Rs.50, 60, 75, 90 and 100. These Auditors are semi-Government servants. Government levies a contribution from the Central Banks and societies on the basis of their capital, and intends to contribute something itself; they are paid by the Government. They work under the Registrar and directly under the Circle Officers who check their work. The audit note is regularly sent to the Circle Officer, who goes through it very carefully and passes it on with his remarks to the Assistant Registrar. The Assistant Registrar, in special cases whenever he thinks it necessary, sends that note to the Registrar, otherwise he himself disposes of it.

36,075. Have you any superior inspectorate or any system of superior audit?—Formerly there was none; but now that system has been introduced and we have a larger staff now. The staff was most inadequate, but it has now been increased. The system of super-audit has been introduced by me recently after this increase.

36,076. Is it in operation?—It has just begun; we had 18 Auditors in 1924 and we have now 52 Auditors.

36,077. That is as regards the audit of the primary societies?—Primary societies as well as Central Banks.

36,078. It is pointed out in the memorandum, and you have agreed, that at present the Central Banks have been charged with the responsibility of management of primary societies. Now, what staff or machinery is available to the Central Banks?—The Central Banks have, generally, according to their size and the number of their affiliated societies, from one paid officer to four or five. Where there is only one he is the supervisor and also does the office work. Where the bank is big enough and has many societies affiliated to it, it has one paid manager and three or four supervisors. There is also one organiser if the organisation of many new societies is desirable; otherwise the supervisors do the work. Some of the banks have also a treasurer or cashier.

36,079. Can you tell us what happens in one of these primary societies when a member makes an application for loan? Would you describe the process of examination?—The member applies to his own society. Each member says that he wants so much. Then a meeting is held wherein it is decided how much is to be advanced to each member. Then they draw up a list of applicants and forward it to the Central Bank. The Central Bank scrutinises the list through its own supervisors. The Supervisor makes recommendations, and the Central Bank finally decides to whom, and how much, money is to be advanced. Now a recommendation has been made that this system should cease and the primary societies

should be given freedom to advance such loans themselves, the Central Bank advancing the money to the society as such.

36,080. How far has the scrutiny of the application by the primary society been a real thing and how far has it been a sham?—It depends on the worth of the society itself. Good societies do something; but I must say that the majority of them are bad at present. They are practically in the hands of a paid group secretary, an accountant who keeps the accounts of eight to twelve societies. He is supposed to be a servant of the society, but unfortunately he becomes their master.

36,081. Who appoints the group secretary?—He is now appointed by the Central Bank, but payment is made by the societies in the shape of contributions.

36,082. Is the statement of assets and liabilities of the applicant for loan available to the supervisor of the Central Bank?—Yes. It is known as the *haisiat* statement and shows what a man is worth. There is fixed what is known as the normal credit and maximum credit, and generally they give advances to the extent of the normal credit. If the man is a defaulter, no further advance is made to him; otherwise he is given up to the normal credit; but in special cases the Central Bank can advance even up to the extent of the maximum credit and sometimes it is even exceeded.

36,083. Does the supervisor go to the village of the applicant?—He goes to every village. One supervisor generally supervises 40 to 50 societies. He does go about and see things. It is only when he is dishonest that there is difficulty.

36,084. To look at another side of the picture: the detailed examination which the Committee made of the 75 primary societies of ten years' standing and upwards showed that the existence of these societies had produced results which could not be considered unsatisfactory. Out of a membership of 2,325, 1,354 members had paid off all debt; the position of 294 could not be ascertained, while 677 were still indebted to moneylenders. That shows that certain societies have rendered good service?—Yes.

36,085. Would you like to see the co-operative movement, as such, attempting the consolidation of fragmented holdings?—I have undertaken it, and it has been done to some extent in Saharanpur district where three societies have already been registered. I was put on special duty in this connection in 1921-22, and I have submitted a copy of my report to all the members. Perhaps it should have been, even normally, entrusted to the Co-operative Department, but Government specifically ordered that it should be done through me, as I had worked on it as a special officer. I consulted Mr. Calvert, who is an authority on the subject, and he gave me certain instructions; I followed those instructions very carefully, and I think there is a good promise of consolidation work prospering in some of the districts.

36,086. What type of district is that?—At present the Government ordered that it should be undertaken only in the Meerut Division which is adjoining the Punjab. I consulted the Collectors of three districts, and three Collectors, those of Saharanpur, Bulandshahr and Muzaffarnagar, agreed that the work could be started there with a prospect of success. In Saharanpur alone we have done some real work, while in the other two districts we are yet doing propaganda only.

36,087. On what right are these cultivators holding their land?—Mostly on occupancy; there are some on non-occupancy also who hold life-interest now.

36,088. On page 245 of your note, you say in answer to our Question 5, Finance, that the present rates of interest on loans by primary societies to individual members are rather too high?—Yes.

36,089. You think they might reasonably go down to 9 per cent.?—Yes.

36,090. "By Government taking upon themselves the responsibility of incurring all cost on co-operative education and supervision, and of distributing *taccavi* through co-operative societies"?—Only to good societies, not to bad societies. I think the Registrar can give a list of such societies to which money could safely be advanced.

36,091. At what rate do Central Banks borrow money?—Generally at 5 to 8 per cent.

36,092. And at what rate do they lend to the primary societies?—Usually at 12 per cent. That amounts to a margin of 4 to 7 per cent.; but they have to spend a good deal on supervision and co-operative education.

36,093. What would you consider a fair percentage to cover administration in the Central Bank?—If they are confined to financing, then it may not be more than 1 or 1½ per cent.

36,094. What is it that makes the management and supervision so expensive under the present arrangement?—They have to undertake co-operative education and organisation of the societies and therefore to employ supervisors and organisers.

36,095. What funds have they in fact to spend on co-operative education?—They have to entertain several supervisors and organisers.

36,096. They have to pay them?—Yes. If they are confined only to financing the members then one manager would do; the supervisors and organisers would not be required.

36,097. Turning to page 247, Question 14 on Implements, you say: "I wrote a pretty exhaustive note on this point in May, 1926, but its office copy has not yet been traced out in the Office of the Registrar of Co-operative Societies," and you promise to send a copy of it as soon as it is traced out. Will you bear that in mind?—Certainly; I am sorry that it has not yet been traced out.

36,098. I suppose that you would not suggest, in this matter of supervision, that the Government should for all time undertake to bear the expense?—No, not for all time, but only so long as the movement cannot stand on its own legs. After all, Government often undertakes to pay 50 per cent. of the expense of aided education, and co-operation is nothing except a kind of education in business principles; education is the main factor in co-operation.

36,099. But there does not appear to have been very much education in the Province up to the present time?—Because we have had a very inadequate staff. The staff was very, very weak indeed, and yet there has been some co-operative education. If the Commission had time, perhaps I could produce many villagers who could prove that they knew something of co-operation.

36,100. Would you turn to page 248, Question 22? You refer to the Oakden Committee's Report and say: "I consider several remarks and suggestions therein not only far too exaggerated but actually wrong." I want to give you an opportunity of pointing out those?—I do not wish to enter into the details of those points now. I only thought that I would be unfair to myself and to the Commission if I did not say anything on the subject.

36,101. I will give you an opportunity of specifying them if you wish to do so?—I do not wish to dilate on this subject.

36,102. In regard to Question 25, on page 249, you say: "I am not in favour of conducting any economic surveys, etc., as they are likely to prove costly and more or less valueless luxuries; the facts ascertained

are also not likely to be accurate" ?—Yes, because people are generally shy in giving out facts. I made some enquiries of the nature and I found they often did not like others prying into their private affairs; they often resent it.

36,103. Have you any personal experience?—When I was put on special duty on consolidation of agricultural holdings, although it was not part of my duties, I made some enquiries and I found that people would not give out facts; they often resented the enquiries.

36,104. And is it from your own efforts in connection with these surveys that you gauge that the facts would not be accurate?—Yes.

36,105. As Registrar of Co-operative Societies, do you regard your office as responsible for the personnel of the Managing Boards of Central Banks?—Not at all; they are elected by the shareholders. Sometimes we wish that a certain man should not be elected, but he is elected in spite of our wishes. We are not at all responsible.

36,106. *Professor Gangulee*: For how long did you say you acted as Registrar, Co-operative Credit Societies?—From 5th August, 1924, to 2nd December, 1926.

36,107. That is for about two years?—Yes, and the appointment of the Oakden Committee was mooted early in 1925, so that I make my position quite clear. It had not much to do with my own work.

36,108. Do you know whether there was any enquiry in these Provinces as regards the extent of agricultural indebtedness?—I do not think so.

36,109. Turning to the question of primary societies, I want to know how often were these primary societies inspected by your supervisors?—The supervisors are the servants of the Central Banks and not of the department. They are expected to visit them at least once every two months, but I am not sure if they do it.

36,110. Can you tell us the nature of such inspections? What do they really inspect?—Their inspection is superficial, I must say. Our Inspectors are very few. There are over 6,000 societies but only 27 Inspectors. I have myself inspected hundreds of primary societies on the spot.

36,111. With regard to this auditing business, at what intervals are these societies' accounts audited?—They should be audited every year.

36,112. Is it done every year?—No, that cannot be done for want of a sufficient number of Auditors. Now that 52 Auditors have been appointed, efforts are being made to see that it is done in future regularly.

36,113. What action do you take when Auditors report on any defects?—This is how many embezzlement cases come to light. Whenever there is anything wrong, we make further enquiries and take necessary action.

36,114. That is with regard to glaring defects. But I am talking of minor defects?—The Auditor is expected to get minor defects corrected on the spot. He should not be a mere cold calculating critic; he should be a real friend and should help them. He should make the correction and tell the people where the mistake lies rather than point out their mistakes as a mere critic.

36,115. In view of the present situation of the co-operative movement in this Province, would you restrict the further extension of the movement and consolidate the present position of the existing societies?—It has been the policy for many years past that there should be very little expansion. We concentrate more on consolidation than on expansion. But there is some expansion, otherwise we would be going back. In promising areas we open out new societies but we concentrate more on consolidation.

36,116. And on propaganda?—We have had no allotment for propaganda in this Province so far, but now Government have been pleased to allot Rs.15,000 for this year and I think that propaganda work has been taken up seriously now.

36,117. Are you in touch with the Education Department in propaganda work?—Yes, we are trying to be; at present there is very little of that.

36,118. Do you receive non-official assistance in the Province in your propaganda work?—We hold co-operative conferences which are attended by non-officials who fully co-operate with us.

36,119. Do the landlords of the Province help you in this?—Yes, but they cannot undertake any constant, steady, daily work. They can give us some assistance once or twice a year or more but cannot take up daily routine work.

36,120. Did you attend the Registrars' Conference at Bombay in 1926?—Yes.

36,121. There was a proposal about land mortgage banks. Do you agree with the resolutions of that Conference?—The Oakden Committee suggested that there should be no land mortgage banks in this Province. Personally I am of opinion that we should have some of them.

36,122. *Mr. Kamat*: Is there co-operation between your department and the Agricultural Department?—Yes, there must naturally be some co-operation, but at present it is not to the extent which is desired, and that is why I have suggested the formation of a Development Board.

36,123. If that is so, would you kindly explain why the Oakden Committee say that the Co-operative Department has failed to make use of the facilities and help given by the Agricultural Department?—This is one of the points with which I do not agree. In fact, there are many points with which I do not agree.

36,124. You therefore think that this indictment of your department by the Oakden Committee is not correct?—Yes. I do not like to dilate on this unpleasant point, but that is the case.

36,125. Now about the economic position of the cultivators: here is a statement in this memorandum that, in the opinion of the Co-operative Department, 60 to 80 per cent. of the cultivators are in debt. Do you agree with that?—To some extent they are in debt; they are not very much in debt. But I have said that some 25 per cent. are heavily sunk in debt.

36,126. You say that you are not in favour of conducting any economic surveys, and the reason you give for that opinion is that you did carry out some enquiries on this line during the course of your special duty on consolidation of agricultural holdings in 1921-22. "The broad conclusion reached by me," you say, "was that economic conditions were slightly improving though the masses even now live almost from hand to mouth." Do you adhere to that opinion?—Certainly; I think there is some improvement, but I cannot say as yet that they are flourishing.

36,127. I wish to point out to you *per contra* the opinion of the Revenue Department in the memorandum supplied to us. They say: "The conclusions reached in chapter 16 are based, in the main, on a careful comparison of regularly published statistics, and appear to be reliable. If they are accepted, the typical cultivator of the west of the United Provinces is found to be in fairly prosperous circumstances"; and about the eastern portion of the United Provinces they say: "The cultivator of the east, though he pays less rent on a smaller holding, makes a worse living, but he, too, has ordinarily enough and to spare." Now, on the one hand your opinion is that the cultivator is living from hand to mouth, and on the other the Revenue Department says that he has a surplus?—I did not say that they lived entirely from hand to mouth, but almost

from hand to mouth. I say the ryot's condition has been a good deal improved, but even now he lives almost from hand to mouth. The word "almost" is important.

36,128. Are you inclined to support the opinion of the Revenue Department about the surplus, or are you inclined to adhere to your own opinion?—I have given you my own personal opinion, and it is for you to draw your own conclusions.

36,129. Even after this divergence of opinion between the opinion of the Revenue Department and your own opinion?—I do not think that there is much divergence; it is only a question of opinion.

36,130. But there is some divergence?—Some opinions always must differ.

36,131. If there is some divergence, never mind whether it is large or small, do you not think an economic inquiry into small villages, at any rate, would be desirable?—I think that is resented by the people concerned, and it will not be of much use. I have said already that it will be more or less valueless, and that the figures will not be accurate.

36,132. If two responsible departments differ in their conclusions, would it not be better to have an economic inquiry?—The Revenue Department claim that they have conducted careful inquiries, but I have done it in a summary fashion while I was on special duty for a few months. I do not claim that my opinion must be considered as valuable in this connection as the opinion of the Revenue Department.

36,133. *Sir Thomas Middleton*: In what sense do you use the term *mahajan*? Do you mean the big moneylender or the ordinary village moneylender?—The petty moneylender.

36,134. You mentioned the case of the Dewan of an Indian State who was compelled to guarantee the loans to *mahajans*. If you were faced with a situation like that, what steps would you have taken?—Perhaps I would do the same.

36,135. There is no doubt that the character and the quality of the *mahajans* of that State would have varied widely. I want to know whether you would not have tried to discriminate between such people before guaranteeing the loans?—I do not follow the question. I see that men advance money. A *badmash's* rupee is worth 16 annas and a good man's rupee is worth the very same.

36,136. There is something behind my question. There would be in such a State a large number of *mahajans* who would come applying to the Dewan for a guarantee. He could make a selection from among them? Could that not be possible?—Possibly it may be so, but I really do not see any difference. Why should I make a selection in case of creditors when one man's rupee is worth the same as another man's rupee?

36,137. If he were to make a selection, do you think it is not possible that he might come to terms with the *mahajans* as to the rates of interest which they would charge?—The rate of interest was uniform; it was all *sawai*, i.e., 25 per cent.

36,138. So that your attitude would have been the same as his, that is, guaranteeing without conditions?—Unless, of course, I knew that usurious rates of interest were being charged; if the rates of interest were uniform and reasonable, then I would not differentiate.

36,139. *Raja Sir Rampal Singh*: You have stated that the control of the Central Banks should be done away with, but at the same time they should go on financing assistance?—I did not say that control should be done away with; I spoke of supervision and co-operative education; financial control will remain. The former means more responsibility than power, I think.

36,140. In what way?—I am of the opinion that supervision, co-operative education and organisation involve more responsibility than power.

36,141. Supposing a society sends a list of members to whom loans should be advanced, if the Central Bank is not allowed to scrutinise that list, would depositors come forward to deposit money in the Central Bank?—Yes; provided the Central Bank took care to see that the society itself as a whole was solvent, people would come forward to deposit money. The Central Bank should deal with societies and not with individual members of societies; otherwise it saps the foundations of co-operation.

36,142. Do you not find a tendency amongst members of societies to have a big loan taken by every member, instead of attending to the real wants of the members?—If every member wants too much, then the society as a whole will want so much more, and the Central Bank will not advance beyond the normal credit of the society. Therefore, the safety is there. Why should the Central Bank advance beyond the normal credit of the society?

36,143. You propose that every supervision should be exercised by the Co-operative Department?—What I mean to say is that the responsibility for organisation, co-operative education and supervision should be undertaken by the Co-operative Department. The banks can make any enquiries as to the solvency of the societies or as to the solvency of the members of societies, and anything like that; we do not want to interfere with their powers in this respect.

36,144. What is the annual grant of the Government for the Co-operative Department?—At present it is somewhere in the neighbourhood of Rs.2 lakhs.

36,145. I hear it is much less than what is provided by other Provinces?—It is the smallest throughout India, so far as I know, amongst the major Provinces.

36,146. *Mr. Calvert*: Smallest per member?—I do not think it is the smallest per member, but the amount is the smallest amongst the major Provinces. I do not mean to criticise Government, but, nevertheless, I think that if it had been possible for Government to give adequate financial assistance to the co-operative movement, perhaps we would have been in a far better position.

36,147. *Raja Sir Rampal Singh*: Would it not have been better if the department had concentrated all its energies over certain localities, instead of diffusing their energies all over the Province?—Perhaps there is some truth in this, but we cannot entirely ignore the wishes of Central Banks. We have to consider and take into account the desires of non-officials in the Province also, and, if they desire a thing, we generally do not wish to override them without very good reasons.

36,148. In years of calamity, have you any experience that even landlords come forward to stand as guarantee for the loans to be given by mahajans?—Yes: I myself do it. I am also a landlord, besides being a Government servant, and in my estate this is done.

36,149. *Professor Gangulee*: You state that the responsibility for co-operative education rests on your department?—I say it should rest on my department.

36,150. We have a note before us, in which, referring to the department, it is stated: "Many officers do not know what co-operation is. To them co-operation means that Government is to supply them with a few simple books"?—Where is this statement?

36,151. In a note submitted to us by one of the officers. Would you agree with it?—The statement is much too sweeping, and I challenge its accuracy. It is not correct. I think it referred to the Revenue Department.

(The witness withdrew.)

The Commission then adjourned till 10.30 a.m. on Friday, the 4th February, 1927.

Friday, February 4th, 1927.

LUCKNOW.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai BAHADUR SIR GANGA RAM, Kt., C.I.E., M.V.O.

Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja SRI KRISHNA CHANDRA GAJAPATI NARAYANA DEO OF PARLAKIMEDI.

Professor N. GANGULEE.

Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S., Raja Sir RAMPAL SINGH. } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S., Mr. F. W. H. SMITH. } (*Joint Secretaries.*)

Captain S. G. M. HICKEY, M.R.C.V.S., I.V.S., Veterinary Adviser to the Government of the United Provinces.

Replies to the Questionnaire.

QUESTION 15.—(*a*) The Civil Veterinary Department should be run absolutely independent of the Director of Agriculture, but veterinary, agriculture and breeding operations should come under one Minister. The Departments of Veterinary and Agriculture, although maintained for the welfare of agriculturists and the general public, differ very much in the functions of their duties, and each should be run by their own technical officers, responsible to one Minister, as it is done in other countries. In the year 1919, when the Department of Agriculture and Land Records (under which the Veterinary Department then came) was split into two separate departments, with their own technical officers and an agricultural officer made Director of Agriculture, which post was previously held by an officer of the Indian Civil Service, the Veterinary Department was made independent, with a veterinary officer as adviser, which up to now has proved satisfactory. If the control of the Veterinary Department was vested in the Director of Agriculture, who does not possess any veterinary qualifications, it would be sure to create a cause of great dissatisfaction amongst officers of the department, and there is always the fear that instead of the department progressing it would be left to stagnate, preference being given to the Agricultural Department, to which service the Director would belong.

Dispensaries in these Provinces are maintained by District Boards, who pay yearly to Government a fixed sum (Rs.672) for each Veterinary Assistant Surgeon lent to them; they also provide funds for medicines, instruments

and hospital necessities and find accommodation for the hospitals or dispensaries. Officers of the Veterinary Department inspect the work of Veterinary Assistant Surgeons and advise the District Boards as to the proper running of veterinary work in their districts; also check the field and inoculation work carried out by Veterinary Assistant Surgeons. But I am sorry to say that most Boards are very apathetic, not providing sufficient funds for the proper maintenance of the veterinary work in their districts, and little or no action is taken on remarks and suggestions passed from time to time by inspecting officers on the proper working of the dispensaries. Also the system under which the department is run in these Provinces being dual, we are always at the mercy of the District Boards for the opening of new dispensaries, etc. We have experienced great hardships by some boards trying to cut down the number of their Veterinary Assistant Surgeons under the old plea of insufficient funds. India is the only country where the dual system would be tolerated for a moment. In countries like America and South Africa, where State aid is given for veterinary work, the working is entirely in the hands of the Veterinary Dpeartment, who are in a much better position to be able to state what medicines, etc., are required and where and when new hospitals and dispensaries should be opened. Another point I should like to bring before the Commission is the inadequate housing accommodation made by most District Boards for the accommodation of veterinary hospitals and dispensaries. Except in a very few instances the housing accommodation is totally inadequate and in no way suitable. It usually consists of a hired house on a cheap rent which lends itself in no way for the class of work that is required of it. They have no proper accommodation for in-patients and are usually situated in the worst locality. Also, under the dual system, the Veterinary Assistant Surgeons are apt to play off their departmental officers against the District Boards and *vice versa*. If the whole of the veterinary work was solely under the Veterinary Department, it would mean that we should have better working, suggestions, when made, if possible, would be carried out, medicines and instruments would be supplied in proper time and not, as now, when the District Boards like.

(ii) The department has expanded during the last ten years, but not in proportion to the needs of the Province.

A Veterinary Assistant Surgeon in charge of an area has got such an extensive circle under his charge that it is often the case that it is impossible for him to manage to visit each and every place which is reported to be affected. To assist him, when possible, the headquarters Veterinary Assistant Surgeons and sometimes Inspectors are deputed, but they are too few to render any substantial help. Besides that, in the United Provinces the climate is such that epidemics break out in several districts at the same time, and so it becomes an impossibility to shift the staff from one district to another. The hands of the local staff become so full of work at times that they cannot leave one part of the area to attend outbreaks prevailing in another part; this means serious losses amongst agricultural stock and the continuation and spread of contagious disease. It is therefore essential that the department should keep enough hands in reserve to meet such contingencies.

Then the staff maintained in a district is extremely inadequate to meet the needs of the department. On an average, a district which has got half a dozen tehsils of hundreds of square miles or so each is allowed not more than four Veterinary Assistant Surgeons, although under the standing orders each tehsil should have a separate Veterinary Assistant Surgeon.

I would go further and say that even one Veterinary Assistant Surgeon in each tehsil is totally inadequate to meet the requirements of to-day if contagious disease is going to be in any effectual way suppressed, and

would suggest that two Veterinary Assistant Surgeons should be allotted to each tehsil, one on purely itinerating work and the other on combined work, who, when there is no contagious disease, should run a hospital or dispensary, and when contagious disease appears should at once proceed and help the itinerating Veterinary Assistant Surgeon to suppress it as soon as possible. Also, when the itinerating Veterinary Assistant is not attending outbreaks, he should at stated intervals visit the larger villages and markets, staying a day or so and carrying out ordinary treatment amongst the animal stock. This is urgently needed, as one can see while touring through the districts. The rural population, except within, say, a radius of five miles of a veterinary hospital or dispensary, has very little help given them for ordinary disease, such as wounds, infection with maggots, injuries, etc. This, I think, would be gradually overcome if, as stated above, the itinerating Veterinary Assistant Surgeons, when not engaged with outbreaks duty, paid regular visits to the larger villages. The villagers, after a time, would get to know of this and would bring their animals for treatment, as I am sure many working hours are lost due to minor ailments of the livestock.

The question of inadequacy of the present staff, the large areas these men have to look after, etc., is, therefore, of such vital importance to the stock owners of this Province that it deserves immediate consideration at the hands of the higher authorities. Undoubtedly, inoculation is the best remedy to arrest epidemics, but it requires an adequate staff and great organisation to make it thoroughly effective.

(*iii*) Yes. Before the inauguration of the Reforms, the present system of the administration of the department worked fairly well, as the official chairmen had a great regard for the advice of the departmental officers, but even then there were drawbacks in the system. But now with the non-official chairmen the department is suffering greatly, and in some instances veterinary work, instead of progressing, has been retarded. The dual system of control is practically impossible with a subject like veterinary work, and in no country in the world, where there is State-aided veterinary work, is the system under a dual control. Take, for instance, in the great outbreak of foot-and-mouth disease at Home, the work of the Board of Agriculture and Fisheries would have been retarded if Borough Councils had had the power of saying that they did not see the reason for shutting up infected farms and the veterinary officers need not proceed to seats of outbreaks as the disease was widespread. This has been my experience with some District Boards.

My presumption, based on the experience so far gained in the discharge of my duties, is that in a country like India, with all her prejudices, ignorance, want of organisation, etc., any scientific department, and specially of a recent birth like our Civil Veterinary Department, cannot successfully be run less it is under the direct control and the supervision of the Government technical officers. The difficulties at present experienced and instances daily met with, for want of independent technical control, I think, are more than sufficient to support my views.

After the coming of the Reforms, it was experienced in the year 1923-24 that the majority of District Boards, instead of helping us to improve veterinary work in their districts, tried in every way to hinder and retard the work, by trying to cut down the number of Veterinary Assistant Surgeons under their control, not giving adequate funds for medicines and instruments or giving suitable accommodation for the housing of the veterinary hospitals or dispensaries. Usually the building provided as a veterinary hospital or dispensary, with the exception of several well-built hospitals and dispensaries, most of which were in existence before the

Reforms came in, are totally inadequate and not at all suited for the purpose. In the great majority of cases the housing accommodation allowed is a small hired building, without any adequate accommodation for in-patients, and usually not over-sanitary.

Another way some District Boards have hampered the work of the department is by the issuing of orders to their Veterinary Assistant Surgeons that they are not to go on tours until they get permission from the chairmen. This means that in a great majority of cases, when the Veterinary Assistant Surgeons have obtained permission and proceeded to the scene of outbreak, they find that the disease has subsided or has spread to such an extent that the district staff is totally incapable of coping with it, and the adjoining districts thereby become affected.

Another way, again, is the present tendency of several District Boards to hand over their *sudder* veterinary hospitals to the Municipal Boards. Their excuse is usually want of funds or that the majority of cases brought for treatment come from the municipal area, and they do not see why they should run the hospital.

Ever since the Reforms came, it has been uphill work for the Veterinary Adviser, the Circle Superintendents and the Deputy Superintendents to try, persuade and make the District Boards see that if contagious diseases are going to be suppressed there must be an adequate veterinary personnel in each district to control the diseases and carry out the work. Valuable time of the officers of the department has been wasted by attending District Board meetings explaining to them the needs of the veterinary work and trying to make them see the necessity of maintaining the minimum number of Veterinary Assistant Surgeons as laid down by Government, and even at the present time correspondence is going on between the department and a District Board with reference to the doing away with two of their Veterinary Assistant Surgeons out of four.

Also I should like to bring to the notice of the Commission that under the present dual system we have very little power over our subordinate staff and experience great difficulties in the transferring of Veterinary Assistant Surgeons as disciplinary measures or in the interest of the department. It has been found that if a Veterinary Assistant Surgeon does not want to be transferred, he goes and gets the District Board to say he is indispensable, which causes a lot of correspondence and unnecessary work, besides making bad relationship between the department and the Board.

All District and Municipal Boards and notified areas should be made to pay yearly to Government a sum of money fixed on the area of the district in the case of District Boards, size and population in the case of Municipal Boards and notified areas for veterinary relief, and the department should be responsible for the entire running of the veterinary work of the Province. The rest of the money should be met by Government as at the present time.

Government at present meets the pay, travelling allowances, etc., of all officers, with the exception of district Veterinary Assistant Surgeons, for whom the District Board contributes at the rate of Rs.56 per mensem for each man, the deficit being met by Government.

(*c*) (*i*).—During my fifteen years' service in India I have seen that agriculturists from year to year make greater use of the Veterinary Department. But, as stated to question 15 (*b*) (*ii*), they are so few and between that full use cannot be made of them. The rural population is still very ignorant and full of religious prejudices so that they are liable to show great apathy towards the minor ailments of their livestock. Not only does this exist in the rural areas, but it is found in the larger towns as well. Nearly every *ekka* pony and bullock or buffalo working on the roads are suffering from some minor ailments such as wounds, saddle or girth galls and in

bullocks and buffaloes neck galls. Directly a wound or gall appears instead of going to the nearest hospital for treatment, they rub in some decoction of their own and continue to work the animal, and when the animal is totally unfit for work then they seek veterinary aid. This can only be overcome if sufficient institutions are formed where they can obtain treatment, adequate supply of drugs, etc., and a lot of propaganda work is done. Also I would suggest that legislation on the lines of the Prevention of Cruelty to Animals Act should be brought into force and properly carried out.

(*ii*).—There are no travelling veterinary dispensaries in the Province. Some years back there were two, but the Boards concerned could not maintain them owing to want of funds.

(*d*).—The present system of controlling epidemics without legislation is effective in its way if properly carried out, but it has got its own drawback which cannot be easily remedied. The *patwaris* are proverbially slow and careless and they have got such onerous duties of their own to discharge that they hardly get time to deal with other affairs. There is a general complaint that they never submit their reports in time which has been from time to time brought to the notice of Government and it is only when the epidemics assume a virulent form that they awaken to bring the matter to the notice of the authorities. In this manner the work of the veterinary staff becomes very difficult and it takes time before the spread of the epidemic is arrested. But it appears that this cannot be helped. There is no other agency that may be suggested in place of the *patwaris*. The *chaukidars* are said to be over worked and as their circles, according to the new Reforms, have been enlarged it has become all the more difficult to get any extra work from them. Moreover, they are illiterate and so they are not likely to be of great assistance in the matter. We have for good or for bad to rely upon the *patwaris* and they should be given something in the form of a reward for honest and good work; if this is done, there is every chance that some improvement will be effected. It is therefore necessary that some amount should be allotted annually to every district for this purpose under the control of the Veterinary Department. Also rewards in the form of *sanads*, money, etc., should be given to villagers who come forward and report outbreaks direct to the Veterinary Assistant Surgeons concerned or even to the nearest police station or outpost who could easily despatch the information to the nearest Veterinary Assistant Surgeon for action. The present reporting system will only be effectual and of real benefit when we can get the people so educated that they voluntarily come forward and report disease themselves. A lot could be done if the educational authorities could see their way to give instruction in all village schools of the benefits of quick reporting and the prompt carrying out of inoculation whenever a contagious disease appears. There can be no two opinions about it that segregation is the second best remedy, but in the United Provinces it has never been a success. In the first place, there is no legislation compelling the agriculturists and other people to keep their stock isolated at places fixed by the officers of the department during an epidemic. This has been borne out each year when *surra* breaks out in the Province. A Veterinary Assistant Surgeon, on either diagnosing a case or it being reported to him, orders the owners of all suspected cases to isolate their animals while he submits blood smears for microscopic examination. On his return with the information that the slides submitted were either positive or negative, it is invariably found that one or more persons have taken their animals from the isolation camp and absconded. If the animal of an absconding owner has proved positive it may take months, if ever, before he can be traced by the district authorities and usually it is found that his animal has died and must have been the source of starting fresh outbreaks wherever he stopped, and secondly, the ignorance of the peasants is a great stumbling block to the improve-

ment of the system. The sound advice given to them falls on deaf ears and nobody is ready to move an inch from the old position which is based on superstition. With sufficient increase in the staff, it may be possible to improve the situation, and if the Government is prepared to enforce some legislation all that is desired will be easily achieved.

This department has often tried to educate the agricultural classes in the importance of segregation as a preventive in contagious diseases by issuing pamphlets on the subject at horse and cattle shows and agricultural exhibitions; but besides enlightening a few advanced and educated agriculturists they have not done much to the peasants in general and in my opinion it can only be brought about by legislation on the same lines as it is carried out in other countries, i.e., Diseases of Animals Act. The educational department has proposed to issue instructions in animal husbandry which, I think, is a step in the right direction if the importance of this is duly impressed on the younger generation.

The third best remedy to prevent epidemics is treatment and it is provided for as far as possible in cases for which there is no inoculation. But this is a matter which depends a great deal on funds. The local bodies do not take sufficient interest, with the result that a very meagre allotment is made for the purpose. However, every endeavour should be made in this connection to stimulate public interest amongst local bodies to this phase in the suppression of contagious diseases.

At a very early date rules should be framed on the lines of the Diseases of Animals Act as in force in other countries.

Whenever practicable, segregation should be made compulsory and the local Government should see that it is carried out, also rules should be framed to stop the transport of animals from or through one infected Province to another or from an infected district to another non-infected district. In this way, an effective control could be put on most of the contagious diseases, as at the present time the unrestricted movements of animals help to spread the disease and in this way India loses thousands of heads of live stock annually.

Steps should be taken by the Government of India to encourage Indian States to take an interest in veterinary matters by establishing veterinary dispensaries in their States.

(*e*).—The serum supply is not always sufficient to meet the demand for want of sufficient funds to defray the cost of the supply.

(*f*).—No fee is charged for inoculation from the public. The obstacles in the way of preventive inoculation have already been dealt with in other paragraphs.

(*g*), (*i*), (*ii*) *and* (*h*), (*i*) (*ii*).—In a country like India where nearly every existing contagious disease is prevalent it is essential that the greatest facilities for research should be made by giving adequate funds both from the Provincial and Central Governments. Each Province should have a properly equipped veterinary research institute under a special research officer who will carry out research work on the contagious diseases commonly met with in the Province and also any disease peculiar to a special tract. In this way, Muktesar Institute could be used for special research work and collaborating the work done by the provincial veterinary research institutes. India being such a vast country it stands to reason that one institute is not enough and valuable material and data could be collected by each provincial veterinary research institute and the whole checked by Muktesar. Then a lot of work now done by Muktesar would be done by the provincial veterinary research institutes leaving the special work of preparing vaccines, sera, etc., to Muktesar, which would save a lot of time as the provincial research officer would be on the spot.

(*i*).—Yes. There being no representative with the Government of India, as the other departments have, to advise the Government of India on veterinary matters and also give advice to heads of departments in different Provinces, the appointment of a superior veterinary officer with the Government of India is extremely desirable.

At the present time each Province is more or less run on different lines and nothing has been done to centralise and organise the veterinary work in India so that precautionary measures can be taken to stop diseases entering from one Province to another or from Native States into British India or *vice versa*. But, on the other hand, by giving each provincial Government full power it has been left to them to run the department on any lines they like.

It is therefore essential at such a time as this, when the idea of the Government of India is to intensify agriculture and in such a country like India where the cultivator depends entirely on his cattle for every farming operation he carries out, such as ploughing, threshing, and carting his goods that we should be represented in the Government of India with an adviser like the Agricultural Department. He could advise the Government of India in their veterinary policy, and also the head of the Veterinary Department in the different Provinces could go to him for advice and guidance in the efficient running of the department or in such an instance, if it were to arise, when the Veterinary Adviser of a Province disagreed with the views of his local Government, he could go up to the adviser with his case who would then decide who was in the right. The Adviser to the Government of India should, at the same time, be the Director of the Veterinary Research Institute, Muktesar, who should be an administrative head. It is also essential that we should have a head with the Government of India like other technical departments to advise the Government of India as this cannot be adequately done by a non-technical man or an officer from another department as it is being done at present.

Oral Evidence.

36,152. *The Chairman*: Captain Hickey, you are Veterinary Adviser to the Government of the United Provinces?—Yes.

36,153. You have provided us with a note of your evidence; would you like to make any statement at this stage in amplification of those notes, or may we ask you some questions?—I have nothing to add.

36,154. Are you satisfied with the degree of touch and inter-communication that exist between yourself as head of your Department and the Agricultural Department?—Yes.

36,155. The Veterinary and Agricultural Departments are entirely separate in this Province?—Yes.

36,156. So that it is very necessary that there should be sympathetic understanding between the heads of the two Departments?—Yes.

36,157. And that you think exists?—It exists here, yes.

36,158. On page 261 of your note, you deal with the question of District Boards in their relation to veterinary dispensaries. What exactly is the extent of responsibility of District Boards? They administer these dispensaries?—Yes.

36,159. To what extent do they control the actions of the Veterinary Assistants who practise at those dispensaries?—The Government lend the Veterinary Assistant; the District Boards pay a moiety of his pay, and they supply medicines, hospital, sometimes a compounder, and the ordinary menial staff; when there is an outbreak of disease the District Boards have the right to let the man go or not.

36,160. But do the District Boards exercise authority over the Veterinary Assistant from the technical point of view?—No; I am the technical officer responsible.

36,161. So that there is dual responsibility?—Yes.

36,162. You are responsible on the technical side?—Yes; the District Boards are responsible for maintenance; they can stop advancement in a district if they like, or they can decide to advance.

36,163. The District Boards can also control the numbers of the Veterinary Assistants?—Yes.

36,164. I understand you suggest that these dispensaries ought to be under your own control?—Yes.

36,165. Have you any indication as to what view public opinion would take of a step of that sort?—I have consulted several chairmen, and they are quite willing to do it if they pay a moiety and Government pay the rest.

36,166. Have you ever heard it suggested that that would be regarded as a retrograde step?—I do not think so, no.

36,167. I suppose in most districts there are one or two men who might reasonably be described as enthusiasts from a veterinary point of view?—Yes.

36,168. But the difficulty is that they are not always the men who get elected to the Boards?—Yes, and also some of the people who are elected do not even know of the veterinary work.

36,169. Have you ever considered the possibility of nomination to the District Boards as a way out of the difficulty?—The only way out of the difficulty that I see is to do what is done in other countries such as America and South Africa where it is a State-aided work and the State carries out the whole work.

36,170. But have you ever suggested the nomination at your recommendation of, say, one member to the Board when the Board is discussing veterinary matters?—I could send an Inspector or a deputy, or I myself could go to a Board meeting; we had to do that at one time in order to keep even our small staff going on, as some Boards wanted to cut their staff in a way that would abolish large sections of it.

36,171. The difficulty is that you cannot be everywhere at the same time?—Yes.

36,172. That being so, would you favour the idea of your right to attend the Board on these occasions being delegated to some person in the district who was an enthusiast in this particular direction?—I do not think it would work.

36,173. On page 262, in answer to Question 15, you say: "After the coming of the Reforms it was experienced in the year 1923-24 that the majority of District Boards, instead of helping us to improve veterinary work in their districts, tried in every way to hinder and retard the work, by trying to cut down the number of Veterinary Assistant Surgeons under their control," and so on. Was that because the functions of the local authorities were extended at that time and a shortage of funds occurred?—A shortage of funds was one thing, and another thing was that we got non-official chairmen. Before then the Collector or the Deputy Commissioner was the head, and instead of that we had an elected non-official chairman. A lot of chairmen have told me they would do what I asked them to do if they had backing.

36,174. Are there any signs of an increasing interest in veterinary work on the part of Boards?—When a Board is elected, the work may progress during their period of service, but when there is a new Board, we have to start working with them again.

36,175. Assuming that the idea of taking away the powers from the local authorities and making them over to you is for one reason or another held to be impracticable, then plainly the best hope lies in trying to increase the interest shown by members of Local Boards in veterinary matters; have you ever considered the possibility of that?—By propaganda?

36,176. Or any other means?—With our small staff we have no other means.

36,177. Has it ever been suggested in this Province that the Veterinary Assistants working in the dispensaries should be under the direct control of District Boards?—No.

36,178 On page 264, in answer to Question 15, you say: "A lot could be done if the educational authorities could see their way to give instruction in all village schools of the benefits of quick reporting and the prompt carrying out of inoculation whenever a contagious disease appears"?—The educational authorities have now taken that up.

36,179. Have you approached the educational authorities?—The educational authorities approached me and asked me to get out a book for them on sanitation, hygiene, animal ailments and breeds.

36,180. On page 265, in answer to Question 15 (*d*), you suggest legislation in the shape of a Diseases of Animals Act. Do you think it would be possible to administer regulations of that sort in this country?—I should fancy it would, after a time if properly worked and sufficient money were given by Government, of course; it would have to be brought in on a small scale to start with and gradually extended.

36,181. It would require a large force of veterinary police, would it not?—I do not think so.

36,182. Would not a good deal of policing be required to control, for instance, the movement of animals from one district to another?—Yes, it would in a way.

36,183. In the same way you suggest that segregation may be made compulsory. If you made it compulsory, you would be up against the same difficulty of enforcing the rule, would you not?—Yes, you will have the same difficulty of enforcing the rule; but there must be something like that.

36,184. You do feel that in spite of the difficulties of the administration it would be worth while to pass an Act of that sort at once?—Yes.

36,185. On the same page you point out that the serum supply is not always sufficient to meet the demand. A previous witness in this Province, a landowner, told the Commission that he had the experience of rinderpest infection in his own herd and had applied to the local dispensary, but not only was there delay, but the serum never appeared at all. That was last year?—We have spent all our funds, and there is the difficulty of finding funds. In the hills we have to give 18 to 20 times the dose we have to give in the plains.

36,186. Why is that?—Because the animals in the hills are much more susceptible to the disease.

36,187. You take an interest in the improvement of the breeds of cattle in the Province?—Yes.

36,188. Have you any suggestions to make outside the familiar ones for achieving that end? I take it that the fodder problem is one of the central questions?—Yes. Most of the animals in this Province are from their birth upwards not fed properly.

36,189. How long have you known this Province?—From 1916.

36,190. Do you see any change for the better or for the worse in the condition of the cattle?—I think there is a slight improvement in the condition of the cattle.

36,191. To what do you attribute that?—People are taking more interest, in my opinion, in the veterinary work, and I think there is a slight improvement in the breed. But there is a vast amount to be done.

36,192. Have you any demand for the simultaneous method of inoculation from the public?—No. At the present moment the villager has to be asked to have even the ordinary serum inoculation.

36,193. But you have large landlords in the country side who might be expected to ask for the simultaneous method?—Up till now only Mr. Sam Higginbottom of Allahabad has asked for it.

36,194. *Sir James MacKenna*: What is your staff at present, starting from above?—The Veterinary Adviser who is myself, and two Circle officers, one being of the Indian Civil Veterinary Department, and the other having come from the subordinate grade.

36,195. Into how many circles is the Province divided?—Into three circles, Allahabad, Agra and Lucknow.

36,196. You take a circle yourself?—Yes. Then there are 16 Veterinary Inspectors, roughly one to three districts, and 179 Veterinary Assistants of whom 15 belong to my personal staff.

36,197. A flying squad?—They are really meant for that purpose; but most of the Boards have not got sufficient staff and most of these Assistants work in the districts.

36,198. 179 for how many districts?—It works to about three to four per district.

36,199. You consider that staff adequate?—No; it is totally inadequate.

36,200. What is your scheme?—My scheme is to have two to three Veterinary Assistants for each tehsil.

36,201. What do you have here, permanent fixed dispensaries?—We have here certain hospitals where the Veterinary Assistant in charge goes out only when there is a bad outbreak of disease.

36,202. You have served in the Central Provinces and Assam. What is the incidence of cattle disease in this Province, relatively, as compared with that in the other two Provinces?—It is very difficult to compare. Here you have the hill tracts, Garhwal and Almora, which are very difficult to control.

36,203. Looking at the figures printed in the provincial memorandum, I think the incidence of cattle disease is not particularly high, 18,000 a year out of a population of 41 millions. It would not be regarded as particularly high, would it?—No.

36,204. You have no scheme for training students of your own?—There was a scheme.

36,205. Have you any research facilities?—I have a laboratory; but I have no time to work in it. What we want is an officer who could have time to give some refresher courses.

36,206. How do you recruit the Veterinary Inspectors?—They are promoted from the Veterinary Assistants' grade.

36,207. Do you give them any refresher courses at all?—Some are sent to Muktesar. We sent three men last year for training in the simultaneous method.

36,208. How do you train your Deputy Superintendents?—They are selected from among the Inspectors.

36,209. So that you have a steady rise from the Veterinary Assistants' grade?—Yes.

36,210. Are they English speaking?—Some are English-speaking and others are not. All the new graduates are English-speaking; but the people recruited long ago are not English-speaking.

36,211. From the veterinary point of view which type of Veterinary Assistant do you find better, the English speaking or the non-English speaking?—The English speaking ought to be better because he can learn more things.

36,212. What about the quality of the Veterinary Assistant?—I think the English-speaking man is a better qualified man.

36,213. Is he good at handling cattle?—Yes.

36,214. Do the Veterinary Assistants come from the agricultural class?—They come from all classes; most of them are from the agricultural class.

36,215. Do you think the present arrangement of relying on the Punjab for education is satisfactory or could you make out a case for a separate school?—I should like to have a central school for the whole of India.

36,216. Teaching in English?—Yes, up to the same standard as at Home.

36,217. Do you think the Royal College of Veterinary Surgeons would recognise the Indian degree?—Yes, if the latter is of the same standard.

36,218. About the serum difficulty, do you think it should be the duty of the Government to provide the serum free?—Yes, of the Central Government; it is only robbing Peter to pay Paul.

36,219. You think that as far as the serum manufacture is concerned, in view of the far-reaching effects of inoculation, it should be a gift from the Central Government?—Yes.

36,220. As regards the question of the revival of the post of Inspector-General of the Veterinary Department or Veterinary Adviser to the Government of India, where, in your view should that officer be located?—He should be under the Government of India and Muktesar should be under his charge.

36,221. Do you think there is enough work for a whole time officer?—Yes.

36,222. What sort of problems are likely to go up to him?—The Cattle Diseases Act and things like that.

36,223. Do you think that that would probably stimulate veterinary research in the Provinces?—I think it would stimulate veterinary work in the Government of India. There is no officer at the present moment to advise the Government of India in any way.

36,224. Have you got a complete scheme worked out for the development of the department in the Province?—We are waiting for a scheme from the Government of India.

36,225. You want to know the method of recruitment proposed?—Yes.

36,226. Have you got a paper scheme for the expansion of your staff at the rate of two or three Veterinary Assistants for a tahsil?—We are preparing such a scheme.

36,227. You are not particularly heavily loaded in the matter of superior staff?—No, it is not enough.

36228. What is your idea of the charge of a Deputy Superintendent? That he should be in charge of a Commissioner's Division?—About that.

36,229. What about the Inspector?—He should be in charge of two districts.

36,230. That would bring the number to 25?—Yes, and four circle officers and one research officer.

36,231. And a Veterinary Adviser?—Yes.

36,232. *Professor Gangulee*: Rinderpest, I understand, is by far the most common cattle disease in the United Provinces?—Yes.

36,233. Can you give us an idea as to what is your agency for notifying an outbreak?—It is done in this Province by the *patwari* who reports to the nearest Veterinary Assistant; on receipt of this report the Veterinary Assistant sometimes asks the permission of the District Board and then proceeds to the scene; he finds out what the disease is and then he tries to get the villager to agree to inoculation if the disease is inoculable, and lastly he wires to me for serum.

36,234. What lapse of time takes place from the outbreak of the disease till the day the information reaches your headquarters?—The average is about a month. Our reporting agency is very bad.

36,235. Perhaps by the time the report reaches you the outbreak is over? —Yes, especially in *hæmorrhagic septicæmia.*

36,236. How would you improve this method of reporting? Have you any suggestions?—The only suggestion is to try and get the people themselves to report.

36,237. Have you the post-card system here?—We had it, but it was not a success.

36,238. For how long did you try it?—About twenty-two years.

36,239. The official records which show the prevalence of these contagious diseases are, I presume, not quite reliable if that is the sort of reporting agency you have?—I think no statistics are reliable really.

36,240. There is perhaps more disease than is actually reported?—Yes, because when the Veterinary Assistant is on tour in a village no report is made sometimes.

36,241. How long does the effect of the serum inoculation last?—Some people say it lasts for a month, some say for a fortnight.

36,242. The figure given in Mr. Edwards' paper is nine days?—Captain Pool worked it out to a fortnight, Colonel Holmes said it was two months and Professor Lingard put it at one year.

36,243. Do you notice any periodicity in the outbreaks of rinderpest?— Yes, if you work it out on a graph you will find that it goes up and down. The cold season brings more of it than the dry season.

36,244. If I remember aright, the germs responsible for rinderpest do not live long in the soil; in India they perish under normal conditions?— No, it can be carried by water, because it is a water-borne disease.

36,245. It lives in the soil also?—I should say in damp soil. Among the Muttra cattle farms we had two outbreaks which were brought about by water.

36,246. I know Mr. Edwards stated that it perishes on exposure upon the soil in ordinary conditions in India within two days?—The virus does, but in damp soil or water it will live longer.

36,247. You say that serum-simultaneous inoculation is not popular here? —Because all that is being done by Muktesar, and nothing is being done by my officials. The other day an officer came to Allahabad to do it.

36,248. Is that because your officers are not sufficiently trained in the methods of serum inoculation?—No, it is the scientist's job. You cannot do it for a little while and then leave it there. You have got to watch the whole operation.

36,249. Could the veterinary personnel now under you do it without any expert guidance?—Yes, but we should really have camps for that work.

36,250. Do accidents sometimes take place in the application of the serum-simultaneous method?—Yes.

36,251. What are these accidents chiefly due to?—To too big a dose of the serum.

36,252. Have you had some accidents?—Muktesar has had them. There is no harm in the ordinary serum which we use.

36,253. The ordinary serum inoculation is done by your Veterinary Assistants?—Yes.

36,254. Where are they educated?—Either at Lahore or at Bombay or in Bengal.

36,255. Do they understand the problems of controlling these epizootic diseases?—Yes, they understand the ideas.

36,256. Do you know who teaches veterinary science in the Agricultural College at Cawnpore?—One of our Veterinary Assistants is lent to the Agricultural Department.

36,257. For how long is he lent? Does he give a regular course of training?—He is attached to the College.

36,258. Are you in touch with the cattle-breeding stations here in the United Provinces?—Yes, from the disease point of view.

36,259. *Mr. Calvert*: In your note you suggest legislation on the lines of the Prevention of Cruelty to Animals Act? Do you mean that the present Act should be extended to rural areas?—Yes, and I should like to mention a case which I detected the other day. A horse was being pulled behind an *ekka* with two spavins, and I reported the matter to the *thana*. But the *thana* people told me that they could not take any action unless I could prove that the horse was being ridden or driven. In Lucknow itself, if you walk any evening on the roads, you will find that 50 per cent. of the animals are either lame or injured, and these animals are made to work.

36,260. Is anything in this Province being done for the improvement of goats?—No; we started sheep experiments, but not goat experiments.

36,261. There is no scope for the improvement of the local goats?—I fancy there is, because some of the best goats are to be found in this Province.

36,262. Is there much scope for the improvement of sheep?—There would be if Government laid out the money to carry out experiments. We proved that we could get good wool here of the Merino variety. I had a lot of pure Merino wool which Cawnpore bought from me. I had made an experiment with half-bred Merinos, and all my wool was taken by Cawnpore.

36,263. Did you find that the people wanted the wool of these half-bred Merinos?—Yes, a lot of people began asking us to give them either wool or rams, but I was unable to meet the demand.

36,264. It is merely a question of lack of funds, I take it?—Yes.

36,265. *Mr. Kamat*: You said that between the time of the outbreak of an epidemic and the time the report reached headquarters sometimes even a month elapsed?—Yes.

36,266. Do you not think that that is sufficient to bring the work of the department, so far as the lower subordinates are concerned, into contempt in the rural areas?—The delay is not caused by the Veterinary Assistants; it is caused by the reporting agencies.

36,267. But the villager does not understand which agency is responsible; all he sees and understands is that the treatment has not yet come?—I do not think that the villager takes much interest one way or another, because if he did he would report it himself.

36,268. *The Chairman*: To whom?—To the nearest Veterinary Assistant.

36,269. *Mr. Kamat*: Do you think that such a state of affairs should be allowed to proceed like this without any remedy?—No, I think that propaganda work ought to be done. If we had the funds and the staff necessary for the purpose, we could get the villagers to come and report it themselves. There is no other agency except the *patwari* to report.

36,270. Which department would carry on this propaganda?—The Veterinary Department. Until we have an adequate staff and propaganda work is taken in hand, the villager will not come forward himself to report.

36,271. What I want to ask you is whether it is not in a way justifiable for the members of the District Boards or the rural people to look upon the Veterinary Department with some sort of apathy till such time as this is actually done by your department?—They do not take any interest in their animals.

36,272. They do not take interest because they feel the treatment does not come promptly?—No, I do not agree with that. First of all, you have got the superstition of the Indian who does not want to report, and who will not have his animals inoculated.

36,273. You do not think that the apathy is due to the delay?—No, it is due to superstitious beliefs in nine cases out of ten. And I know of cases where at first the people said they wanted their animals to be inoculated, and I took the trouble of sending my Veterinary Assistant for the purpose, but as soon as he arrived there the people said they did not want it, and this was obviously due to somebody telling them not to inoculate their animals because something inauspicious would happen.

36,274. That is with reference to inoculation, but not with regard to other sorts of treatment?—We are talking about inoculation; in fact most of our diseases are contagious and require inoculation.

36,275. About the attitude of the District and Local Boards particularly after the inauguration of the Reforms: have you studied the financial position and the budgets of these District and Local Boards?—Yes.

36,276. Is there sufficient money to go round, for roads and communications, education, primary schools, sanitation and so forth?—That is always the excuse; they say they have no funds.

36,277. I am not asking if that is the excuse given. I want to know whether you have examined the budgets and found for yourself whether there really was sufficient money to go round for all these purposes?—The only one I have looked up is the budget of my own department.

36,278. You have not satisfied yourself whether there is sufficient money in the budgets of the District Boards to meet the various needs of the district?—I have talked matters over with one Chairman of a District Board sometimes, and he has often told me that his Board was hard up, that there was not enough money, and what little there was had to be allotted to more pressing needs.

36,279. About this system which prevails in America and South Africa: do you mean to say that the local bodies there have nothing to do with the Veterinary Department?—Nothing whatever; they work purely under the Government, just after the manner of the Board of Agriculture and Fisheries at Home.

36,280. When you make that statement are you quite sure that in England the Veterinary Department has nothing to do with the local bodies?—Nothing at all; the veterinary branch of the Board of Agriculture and Fisheries is run by Government.

36,281. But the local bodies have certain Acts to carry through, and surely they must be contributing something towards the veterinary work?—I do not think they contribute. At any rate the Contagious Diseases establishment is run by the Government.

36,282. And your proposal is similar to that, namely that the Government should run the department and the local bodies should contribute?—Yes. I have no objection to the Government contributing the whole money; but I do think that the local bodies ought to contribute something indirectly.

36,283. Do you think that the local bodies should pay the greater portion of the money?—No, I think you should put a levy on District Boards for a certain amount and the Government also should pay a portion.

36,284. So that the major portion of the contribution must come from the local bodies and yet they should have no control?—I do not see why they should. I do not see why a layman should have control over a technical subject at all.

36,285. They should pay the piper and somebody else should call the tune?—They would always have a say in the matter, by protesting against anything which in their opinion was not being done satisfactorily.

36,286. In the matter of primary education this is not the arrangement; it is a dual system?—I object to the dual arrangement, because there is an old saying: "Too many cooks will spoil the broth."

36,287. In the case of primary schools, it is the District Local Boards who see to the opening of schools, and they have control over the teachers; Government simply pay a contribution, and the complaint that you make in the matter of veterinary subordinates is not to be found there with reference to primary school teachers; at any rate, there is very little complaint. If that dual system works in the case of primary schools and the primary school teachers, I wonder why it should not work in the case of the veterinary subordinates?—The Veterinary Department is a technical department for overcoming cattle disease and things like that, but the other is purely an educational matter. Wherever you want education, you will find that the District Board will put their money down for it, but they will not do it for the Veterinary Department.

36,288. But the principle of control over subordinates is common to both. To decide whether a man should be transferred, it makes no difference whether he is in the Veterinary Department or the Education Department?—I find that the trouble is trying to transfer the men. I have always found the men going behind me to the Board, and getting themselves excused from being transferred.

36,289. All over the country, in the case of primary school teachers, the control rests with the District Boards, although there is the Education Department. If that system works in the case of education, why should it not work in the case of veterinary matters?—It does not seem to work.

36,290. *Mr. Pim*: You said that you had discussed with the Chairmen of several District Boards the proposal of transferring the control from the District Boards to Government?—Yes.

36,291. They were quite in favour of it?—Yes.

26,292. Do you think that any of them would have ventured to put forward a proposal of that kind to the Board?—No. This was the view expressed in purely private conversation. I do not think they would bring it forward as a scheme of their own, but if the scheme were put up to them, they might give their opinion in favour of transferring the Veterinary Assistants wholly to us. I do not think that any Board will bring forward such a suggestion themselves.

36,293. *Professor Gangulee*: Why will they not do it?—They will want to retain as much control as they can. They will not of their own accord put forward such a scheme, but if the proposal were put up to them, they might take it up.

36,294. *Mr. Pim*: Have there been any widespread complaints as to the actual work done by the Veterinary Assistants?—No. You might get one or two cases put up for bad work; that is dealt with departmentally; that is all.

36,295. Apart from the money question, why is it that in a matter which so intimately affects their interests the members of the District Boards, who presumably are the more intelligent men of the district, do not realise the advantages of the department more?—The only thing that I can think of is the apathy on their part to animal diseases.

36,296. They do not believe in the results?—At first, there is prejudice against treating their animals by inoculation and things like that, but directly you can get inoculation done in a village in one or two cases, you can do it in the whole of the village afterwards. It is the initial start-off which is difficult. Now we are getting people coming forward to have their animals inoculated.

36,297. And that prejudice is breaking down now?—Yes; and I think with more Veterinary Assistants and smaller areas to look after you would be able to break it down much more.

36,298. Would there then be any danger of making the administration and control entirely provincial, and of reducing the local control?—No. If you had a bigger staff, it would be stimulated.

36,299. Would you be able to control so many men working in the districts? You know that very often imaginary tour diaries are given?—Yes, but that is the case in every department.

36,300. *Sir Henry Lawrence*: What was the original intention of the post card system? That the *patwaris* should report by post card direct to you?—To the nearest Veterinary Assistant.

36,301. These post cards were issued to the *patwaris*?—Yes, with a stamp on them.

36,302. How was it found to break down?—They did not take any interest in sending the post cards in.

36,303. By what method do they communicate their reports now?—They report direct to the Veterinary Assistant by letter, or they send somebody, or something like that.

36,304. Do you think that a sufficient trial was given to the post card system? You said that it went on for two years. Do you think that two years is a sufficiently long period to give you full experience with regard to the introduction of a new system to a class of man like the *patwari*?—I do not think so.

36,305. Would you like to re-introduce the system?—The system I would like to have is that the headman of the village should be supplied with post cards on which the names of the various diseases are printed, and when any disease occurs he should put a cross against that disease on the post card and send it to the nearest Veterinary Assistant.

36,306. Is anything being done in that direction?—No.

36,307. Is that for lack of funds?—Yes, and lack of getting it put up.

36,308. Is that not a matter that rests within the discretion of the head of the department?—I have put it up to the local Government. I put on *chaukidars* to do the work, but it was found impracticable.

36,309. Is this system working in any other Province, to your knowledge?—I am not sure about it.

36,310. Do you know what system prevails in other Provinces?—In Bihar and Orissa it is the village *chaukidar*, and he is given rewards if he does it in time.

36,311. Is that found very satisfactory?—More or less; none of them are really satisfactory. The *patwari's* excuse here, if he does not report in time, is that he has other work to do.

36,312. But you are anxious that something should be done to improve it?—Yes.

36,313. What is the exact method that you are now advocating for the improvement?—The one that I would advocate is to get the man to report himself.

36,314. By making it compulsory?—No. It should be as they have it in South Africa. If rinderpest breaks out there, they send for the nearest Veterinary Surgeon; it is done by the owner of the cattle.

36,315. That is owing to the education of the man?—Yes, and knowing the value of his animals.

36,316. Have you ever estimated what is the money loss to the Province from preventible cattle disease?—No.

36,317. Could you make any estimate of the kind?—It could be done if inoculation were made compulsory.

36,318. If you had sufficient staff to deal with contagious disease, what would be the saving in preventible loss?—The saving would be about half the present mortality.

36,319. Could you give us that in rupees? Would you think it out and let us know?—I could let you know.*

36,320. What is the present value of the total cattle population of the province?—From Rs.5 to Rs.300 a head.

36,321. What is the present value of the total cattle population of the Province? Would you work it out and let us know?—Yes.

36,322. What is the expenditure on your department? I want to establish some relation between the two?—It is just over Rs.3 lakhs.

36,323. What do you pay for these doses of serum?—We pay different prices, from 2 annas to 3 annas. Up till last month we had to pay the price of 18 plains doses for one hill dose, but the Government of India has now cut down the price of the hill dose to the price of the plains dose. They are supplying 18 times the amount of serum for the hill tracts for the same price at which we buy a plains dose.

36,324. What happened when you had this outbreak in Garhwal?—The money went for paying for the serum in Garhwal, and the expenditure in the various districts and Garhwal was disproportionate. We had no way of effecting a saving before the Government of India reduced the price of serum.

36,325. When was this done?—Last month. They have done it for the whole year, from the 1st of April to the 31st of March.

36,326. It seems very unsatisfactory from your point of view that you should have to use all your serum in one district and that the other 47 districts should go without it?—It is a serious problem. Garhwal is the purchasing place for all kinds of cattle. It is not only a local problem, it is an All-India problem.

36,327. This is due to the Government of India's interest in the Muktesar Institute?—I should think so.

36,328. *Sir Ganga Ram*: Do you have a veterinary college here?—No.

* With a staff of 428 Assistant Surgeons a calculated saving of Rs.59,96,280 would be effected per year and this figure could be greatly increased by introducing compulsory inoculation and adequate reporting system. 1925 Census: total number 4,14,73,357; value Rs.6,21,11,00,365.

36,329. Where do you send your students for training?—We have not been sending any students for training for several years because we have been overmanned, but we used to send them to Bengal or Lahore.

36,330. You cannot train Veterinary Assistants yourselves?—No.

36,331. Altogether, how many Veterinary Assistants have you got?—179.

36,332. Your annual requirements would be about 10 per cent.?—For several years we have had no requirements at all. The trouble was that the District Boards cut down the number of their existing staff.

36,333. When the Veterinary Assistants give advice, is there any regulation about what fees they should charge for their private practice?—There is no rule.

36,334. Is there no regulation as to what they should charge, or can they charge anything they like?—I do not think they can charge anything they like.

36,335. It looks like it, if you have no regulation?—There is no Government rule on the subject, but a note has been drawn up by the Veterinary Association showing the minimum amount of fees which a Veterinary Assistant Surgeon may demand.

36,336. You have no travelling dispensaries?—No.

36,337. You have no funds for that?—The District Boards have no funds.

36,338. *Sir Henry Lawrence*: In what cases does the Veterinary Assistant charge fees?—For private work. If you had a horse, and you called him for his treatment out of hospital hours, he would charge you; but for contagious diseases or treatment in the hospital he cannot charge you anything.

36,339. *Sir Ganga Ram*: If the cultivator has a sick cow, is the Veterinary Assistant entitled to any fee for treating that cow?—When he is going through the village, no. The touring Assistant goes from one village to the next. When he is in a village, he calls up the people, talks to them, and asks them if they have got any animal which is sick, and if they have any, he treats it free.

36,340. If any animal gets ill suddenly, has not the cultivator the right to call up the Veterinary Assistant?—No. The fact is that each Assistant may have under his charge an area of 40 square miles, and he cannot go on answering calls for the treatment of sick animals from all over the territory. He has to go from village to village.

36,341. By the time he comes to the village where the cow is sick, the animal may have died. In serious cases, can he not come and give advice?—It is the drawback of the big areas that the men have got to look after.

36,342. You have not got sufficient funds?—No.

36,343. Would you be in favour of introducing a simple course of veterinary science in the Medical College, so that the civil medical officers could do ordinary veterinary treatment themselves?—No.

36,344. Why not?—One might as well suggest that Veterinary Assistants should take a course in human medicine. Each man should stick to his own job. The Sub-Assistant Surgeons would object to doing veterinary work. Moreover, wherever there are civil dispensaries, there are usually veterinary dispensaries.

36,345. That is certainly so in the large towns, but not in the villages?—No.

36,346. The Sub-Assistant Surgeons would be glad to have the extra work?—I do not think they would do it.

36,347. Is it professionally impossible?—The Sub-Assistant Surgeons would not take it up.

36,348. Why do you not make your own serum? Why do you leave it to Muktesar?—It would mean setting up a laboratory to replace Muktesar. It would cost a lot of money.

36,349. *Sir James MacKenna*: Muktesar is in the United Provinces?

36,350. *Sir Ganga Ram*: Yes, but we find the Government of India is making a great deal of money out of the manufacture of serum?—We say it should be provided free.

36,351. *Sir Thomas Middleton*: With reference to the position in Britain to which reference was made a few minutes ago, is the treatment of certain contagious diseases governed by the Contagious Diseases (Animals) Act?—Yes.

36,352. And is it for the supervision of the working of that Act and the treatment of the animals that are affected by the scheduled diseases that the Ministry of Agriculture and Fisheries and local authorities maintain veterinary officers?—Government maintains Veterinary Assistants, but the other bodies have private practitioners who are called in and receive fees for doing the work.

36,353. The great bulk of the diseases with which animals are affected in Britain are not scheduled, and they are treated by ordinary private practitioners?—All contagious diseases of animals are scheduled.

36,354. Non-contagious diseases are not scheduled?—No, the ordinary private practitioner deals with them.

36,355. In the United Provinces your staff has to deal with both classes of disease. They have to cover the work not only of the official Veterinary Surgeons of Great Britain, but of private practitioners as well?—Yes. There is practically no such thing in this Province as a private practitioner.

36,356. What is the total number of Veterinary Assistants available in the United Provinces?—179.

36,357. How many do you think are required to cover the Province reasonably well?—Two in each tahsil.

36,358. That would mean about 300?—Yes, between 300 and 400. There will be one stationary Veterinary Assistant who would help when outbreaks are very bad, and a touring Assistant.

36,359. Sir Henry Lawrence asked you to make an estimate of the value of the livestock in the United Provinces. You mentioned that animals might vary from Rs.5 upwards. What are you going to do with the five rupee animals when you come to make your estimate of value? How do you propose to treat them in arriving at your estimate?—You would have to take an average.

36,360. Would you not regard the five rupee animal as better dead?—It would be so in nine cases out of ten.

36,361. Will you add them to your total?—We will have to count them in.

36,362. *Raja Sir Rampal Singh*: You have stated that District Boards lack interest in the work of the Veterinary Department. Do you find the same lack of interest in other spheres of their activity?—I do not think I have ever gone into it.

36,363. You can take it from me that as far as medical treatment in the villages is concerned and as far as education is concerned, they are very keen, and they are gradually introducing new dispensaries and appointing *hakims* and *vaids*. What is the reason why they are so apathetic towards the Veterinary Department?—I think it is because, first of all, it is a young department. The Medical Department and the Agricultural Department have been in existence for very many years. Our department is a young department and the people have not appreciated the benefit of it.

36,364. I think they have not great confidence in the work of your Veterinary Assistant Surgeons?—I would not say that. They have not had sufficient experience of it yet.

36,365. How long is it since this department was started?—About thirty years.

36,366. Do you mean to say that within these thirty years they have not been able to appreciate the work of the Veterinary Assistant Surgeons?—I do not think they have been able to, because there are so few of them. There are areas in the Province not touched by them; in some areas the villagers never come in contact with them.

36,367. Is it your experience that these villagers like to have their own *ahirs* and *salutries* to treat their cattle instead of your Veterinary Assistant Surgeons?—They like to treat them by their own methods, just as they try to treat human beings by their village methods.

36,368. But are they not successful?—Not nearly so successful as the ordinary European treatment.

36,369. Well, the question is difficult in my opinion, because some European gentlemen themselves told me that the treatment given by the *salutries* was better than the treatment of the Veterinary Assistants. Mr. Ford once told me that the *salutries* knew better how to treat horses than the veterinary surgeons did?—I think that is because these men were in the Army and were trained there; they were brought up with horses, and from the point of view of horse knowledge I think they are better qualified than the present Veterinary Assistants; but the latter have more technical knowledge.

36,370. Do your Veterinary Assistants use indigenous medicines?—They use country drugs, yes. We supply them with English drugs and with country drugs bought in the ordinary bazaar; sulphur, ammonium chloride, borax, and so on.

36,371. I will tell you my own experience about this. Once I had occasion to call in a Veterinary Assistant to treat a she-buffalo of mine, and the prescription that was given to me cost me Rs.32. I had to get it from Lucknow. Afterwards I called an *ahir*, and he cured it by giving it some leaves and other things, which cost me only a pice. After all, it will be very difficult for the Government to provide every small circle with Veterinary Surgeons. Would it not be better if some training were given to our village people, so that they could treat the village cattle and cure all sorts of common, non-contagious diseases?—I think a lot could be done by propaganda work among the villagers, telling them how to give simple treatments, but with most villagers even if you give them simple treatments, they will not treat their animals.

36,372. *Professor Gangulee*: Are there any private practitioners in this Province?—There is one in Meerut and I think there is one in Allahabad.

36,373. Have they got a good practice?—The man in Meerut has a good practice.

36,374. I see the number of inoculations is increasing?—Yes.

36,375. So superstition is becoming less of a bar there?—Directly a villager sees the result of inoculation is good, he will be converted to the method.

36,376. There has been a distinct increase in the number done in recent years?—Yes, and this year we could have done still more if we had had the serum.

36,377. *Sir James MacKenna*: It is distressing to hear any suggestion of shortage of serum, especially in the Province where it is made. Was that due to bad budgeting?—No. It was due to an outbreak of virulent disease in Garhwal, where we had to give 13 times the ordinary dosage.

36,378. Could you not have got a special grant?—We did, but a period elapsed before it could be renewed.

36,379. *The Chairman*: How long?—Two months.

36,380. *Sir James MacKenna*: Have you ever known a case of the budget allotment for serum not being expended?—Yes, if only mild outbreaks occur.

36,381. Could you not buy serum and send it to a small storage centre to be kept in cold storage? It seems to me it would be an absurd extravagance to manufacture serum in the United Provinces?—It would mean overlapping of work.

36,382. Would not the storage of serum be fairly simple? We did it in Burma?—It could be done.

36,383. It seems to me to be rather a Gilbertian position, and the United Provinces is the last Province in which I should expect to find any storage difficulty?—It is purely a money matter. We are going to look into the question of storing at different centres; at present I can only store it here.

36,384. Is that cold storage?—No, not cold storage; only pit storage.

36,385. *Sir Ganga Ram*: What is the system now of castrating bulls? Is it done by a surgical operation or by the old method?—It is done by the Italian method; there is no bleeding. Mulling is still being done by the villagers; I saw a case the other day where an accident occurred while the mulling was being done.

36,386. The villagers are not yet convinced of the convenience of the new system?—No.

36,387. *The Chairman*: Are you responsible for the propaganda directed towards popularising poultry breeding in the Province?—I am President of the Association.

36,388. Does it come within your departmental responsibilities?—The budget comes through me.

(The witness withdrew.)

Mrs. A. K. FAWKES, Secretary, the United Provinces Poultry Association.

Memorandum on the Poultry Industry of India.

How the industry is conducted.—The poultry industry of India is carried out between the peasant producer on the one hand and the purchasing consumer on the other by means of agents or professional dealers. The entire organisation is unofficial and up to the present time the Government of India has had no concern or interest in the industry.

Species of poultry found in India.—India, Burma and Ceylon are presumed to have given to the World the genus Fowl and the earlist historians allude to the species going Eastwards to China in about B.C.-1400 and Westwards somewhere about B.C.-500 or B.C.-600, but the origin is lost in antiquity. The ancestors of the species, the wild Jungle Fowl (*Gallus Bankiva*), and the pure-breed *aseel* or Indian Game are still to be found in the jungles and breeding areas of this land. At the present day there are four divisions of fowls prevalent in India; they are as follows:—(1) The division whose type mostly resembles the Jungle Fowl, these birds carry the Jungle Fowl colouring and shape, are quick maturing, high flying,

rarely exceeding 3 to 3½ lbs. in weight, and are poor producers. This resemblance is noticed to be stronger in the villages close to the habitations of the Jungle Fowl. (2) The type most closely resembling the Indian Game, being heavier in weight, slow maturing, tight feathered, useful as table birds but poor layers. The pure-bred game is rare and only found in certain breeds' hands. Indian Princes and others keep them mostly for cock-fighting purposes. They are not obtainable outside these circles. The Chittagong fowl, a native of that district, is a valuable pure breed of India well worth attention. (3) The third type of fowl shows a strong admixture of foreign blood. Sometimes the influence is from further East, the Chinese type predominating, but more often Western breeds of fowls show their characteristics. These types of fowls are more of a commercial asset to the country, as although very mongrel they are of better size and are better producers than either of the types previously mentioned. The Western influence on the third type of fowl is of course due to the many birds brought out by British people to India, which eventually spread their progeny throughout the neighbourhoods. Unfortunately the Indian poultry breeder is as a rule entirely ignorant and careless as regards the breeding of his fowls, and only education can alter this. (4) Various types not included in the above classifications may be said to form the fourth division of fowls, one variety of which is perhaps worth mentioning in that it has the peculiar characteristic of being black skinned and black in flesh, but it is of little commercial value.

As a general rule, it may safely be said that the entire species of domestic fowls, etc., are much smaller than those found in the Western countries. The average weight of an Indian chicken when dressed for table rarely exceeds 3 to 4 lbs., and the hen's egg averages 1¼ to 1½ oz.

Approximate production.—As no census has ever been taken of the number of head of poultry in India, it is impossible to give any accurate data on this point. Taking, however, the population of India we find that there are some 316 millions of people, of which 68½ millions are Mahommedans and 4½ millions are Christians, the remainder being Hindus, Sikhs, Jains and other sects. The first two mentioned religious divisions are meat eaters, and therefore probable consumers of poultry products. The higher caste Hindus on the other hand are vegetarians, and have no interest in the industry; on the contrary they look upon poultry as unclean, though education is changing this attitude as will be shown later on in our report. The lowest castes of Hindus, however, with the poorer classes of Mahommedans form what we may term the actual poultry breeders of the country. They are mostly too poor to eat what they grow, but sell the products to dealers. The Christian population are undoubtedly the chief purchasers of poultry products. If we assume, therefore, that half the Christian population plus 5 per cent. of the Mahommedan population consume on an average say one egg per head per diem we may have some basis on which to estimate how many head of fowls there are likely to be in the country. The number of consumers works out at a round figure of 5½ millions, and knowing as we do that the average Indian hen produces somewhere in the region of 50 eggs per annum we arrive at a hen population of not less than 38½ to 40 millions. Adding to this the probable number of male birds and young chickens, our calculations being based on observations made on a small scale, we conclude that somewhere about four to five hundred million fowls is a likely total. If we allow another hundred million to cover the possible head of geese, ducks, turkeys, pigeons and guineafowls we have a grand total of about six hundred million birds. Again, basing our calculations on the fact that each peasant farms from six to ten head of fowls, for we find that conditions point to these figures, we arrive at the conclusion that some 50 million persons participate in this cottage industry.

Methods of marketing.—The organisation for the marketing of eggs and fowls is in the hands of professional dealers who make house to house collections and transport the produce by rail, river or road to the market towns. Many of the circles of egg collection are very extensive, eggs coming from a 200 mile radius and more to central markets. The railways encourage the transport of eggs by charging only half parcel rates on such consignments, whereas they discourage the transport of live fowls by charging very high freightage. Eggs are sold by numbers and not by weight, they are packed in baskets or large earthenware vessels, and in lieu of the Western label notifying that care should be exercised in transport an egg shell denotes the perishability of the contents. The prices realised for poultry products vary in different parts of the country. To take a few examples: An investigation into market conditions in Lucknow as regards eggs shows winter sales from November to February amounting to some 5,000 eggs per day, realising a retail price of from 9 to 12 annas per dozen. During the hot weather months the sales are halved and the prices fluctuate between 7 and 9 annas per dozen. The villagers receive but half the amount realised by the retail merchants, and in many cases even less. A report from Bombay gives the sales of baskets of 650 eggs realising from Rs.16 to Rs.32. The villager who supplies these eggs does not receive more than about 2 as. per dozen, if as much. A report from Madras City itself shows that eggs in large quantities can be brought from villages at as low prices as Rs.3 per thousand, but the retail rates are 6 as. per dozen. It looks as if the poor ryot is largely exploited by the professional egg merchant in most cases.

No recognised standard for size of egg exists, but the larger egg commands a slightly better price. The average weight of an Indian egg is 45 grams, or 22 to the kilo, but in the United Provinces and other areas where some improvement in poultry breeding has been done, the egg may reach 52.6 grams, or 19 to the kilo.

Table fowls are sold by piece, though size of birds controls the price. Roasting fowls in various markets fetch from 12as. to Rs.1-8-0 according to demand, and curry fowls or small chicken fetch 8as. to Re.1. The village producer gets about half these rates.

Chittagong district is an area which produces vast numbers of eggs and fowls, and supplies go from Chittagong to Burma as well as to large cities like Calcutta and Darjeeling, and many ships provision themselves with stocks of eggs and fowls brought from this district.

Much might be done to improve the economic condition of the peasant producer of poultry if he were assisted to keep better stock and by means of co-operation helped to secure a fair price for his produce instead of being, as he is now, exploited by the professional dealer.

The by-products of poultry, such as feathers, fertilisers, gizzard linings as a source of commercial pepsin, egg shells as a source of powdered calcium carbonate are all wasted in this country, and the vast potentialities of poultry production unrecognised.

As the standard of living improves in India so will the demand increase for what other nations have proved to be, next to milk and bread, the most valuable food in existence.

The value of all poultry products has gone up 50 per cent. during the last twenty years.

Conditions under which the Poultry Industry exists.—The poultry of India, with certain exceptions, are, as has been previously pointed out, small in weight and size, and indifferent producers of small eggs, but the reason for this is not difficult to see. The poultry keepers of India are poor and ignorant men and they make no attempt to select or breed their poultry on any system. The birds interbreed as they please, and roam the villages scavenging in the drains and rubbish heaps of the vicinity for their food.

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An occasional handful of grain is all they can hope for, and they depend, like the fowls of the air, on what they can find for themselves. Unlike the fowls of the air, however, they are susceptible to many diseases, and often whole flocks are decimated by visitations of cholera, chicken pox, and the fever caused by the invasion of ticks. This is augmented by the insanitary conditions under which they are kept. In spite of these hard conditions many survive, and the indigenous fowl is on the whole a hardy bird and will endure very adverse circumstances. We have only to witness the cruelty they undergo in transit to market, or awaiting sale in the market places, where they are densely crowded in small baskets, often left in the sun without food or water for many hours, to realise what they are capable of living through. Even under these conditions they help to pay the rent of the peasant and contribute in a very valuable way towards the feeding of the community. How much more productive the poultry of India could be is easily imagined, and what a valuable contribution could be made to the world's production of food if India's vast acreages were put to fuller use, is obvious.

Poultry Breeding in the United Provinces.—For the past twenty years small efforts have been made by keen poultry fanciers to effect some improvement in Indian Poultry and an unofficial body styling themselves the Indian Poultry Club organised originally by Colonel Tyrrell, R.A., have been largely instrumental in interesting the public in pure bred fowls. They have done and are doing a great deal of useful work in this direction and hold important Poultry Exhibitions annually in Calcutta and other parts of the country. They also publish a useful journal called the Indian Poultry Gazette. They are much hampered by lack of proper funds. The present Hon. Sec., Mr. A. E. Slater, is doing valuable poultry work among the depressed classes of Etah district, United Provinces.

As an outcome of the Club's efforts, Sir Harcourt Butler in 1919 asked the Government of the United Provinces to finance a small scheme which would have as its object the improvement of poultry in the United Provinces. This being sanctioned, Government asked me to come out from England to take up the post of Poultry Expert, as in addition to an English training at Wye Agricultural College I had had experience of Indian conditions having acted as Hon. Sec. of the Indian Poultry Club in former years. An Association was formed for the Province, Sir Harcourt Butler himself guiding its constitution and I was appointed Secretary. I was asked to estimate for and draw up a scheme to promote the interest of poultry farming in the United Provinces. Briefly my scheme was as follows:—(1) To popularise the breeding of good fowls by illustrated lectures at all the principal centres of the Province. (2) To organise poultry shows at all agricultural fairs in the Province. (3) By the establishment of two poultry farms, one at Lucknow and one at Naini Tal, to demonstrate how poultry farming should be done and also to provide pure bred stock for distribution throughout the Province.

This scheme was sanctioned by Government and an initial grant of Rs.40,620 was given to the Association to enable it to carry out the programme. The cost of building and stocking both these farms amounted to some Rs.25,703. The cost was enhanced owing to the higher rates for labour and building materials prevailing at the time.

My staff consisted of a lady assistant in charge of the Lucknow farm, and the part services of another lady at the Naini Tal farm, and one office clerk with two peons, excluding the menial staff employed on the farms.

During the years 1920 to 1922 the policy of the Association was to assist the poorer classes to obtain good poultry and with this object in view we sold settings of eggs at a moderate price. We also co-operated with

Mr. Slater, a missionary of Etah district, United Provinces. This missionary was devoting his time to raising the status of some 15,000 of the lowest castes by teaching them to raise poultry. Under his supervision we gave large numbers of male birds to be crossed with village hens. He also, from his Mission farm gave out quantities of eggs and birds free of cost, and the result of our combined efforts to-day is, that there is a large self-supporting community in Etah growing extensive stocks of good poultry and last February one thousand birds were put up for my inspection at the Etah Poultry Show. The Association carried out this policy of distributing good stock in other centres also; for instance through the Court of Wards manager of Kantit Estate in Mirzapur district and through the district Boards of Moradabad and Saharanpur. In some cases we were successful but we realised that unless the work was supervised by reliable and knowledgeable people the results were indifferent.

From 1922 onwards, owing to various causes, the Association was directed to cut down its budget demands and to put the work on to a self-supporting basis. We also found that other poultry farms were starting business in the United Provinces and the feeling was that a Government farm should not sell at lower rates to the public than other farms were doing. In order to put the farm on a business footing, we amalgamated the Naini Tal farm with the Lucknow farm under one European Manager on a salary of Rs.300 per month. This necessitated the cessation of the free distribution of stock, etc., though we continued to do what we could in this direction. Much experimental work that I had planned had to be curtailed. However, year by year the farm grew in popularity and the interest aroused in poultry farming spread to all parts of India. Our stock was sought after from all parts and we cannot in any measure fulfil the orders we receive. There is ample scope for a large extension if the capital were available.

My correspondence has become a very heavy part of the work and letters asking for advice come from all parts of the country. The number of letters replied to by me personally during 1925-26 was well over 4,000. My office staff consists of one man and he has to carry out the duties of accountant and clerk for the work of both the farm and office. The responsible post of Farm Manager is at present held by an Indian, a Brahmin by caste, who has been in the Association since its formation, having previously been in charge of the clerical work. He is not very experienced, and the appointment was made as a temporary measure with a view to testing the capabilities of an Indian in work of this kind.

Experimental work.—Experimental work has been done at the Lucknow Poultry farm under the following heads:—(1) Pure bred imported stock have been kept successfully, living through the tropical conditions of the plains. They have produced good progeny, and their egg production, especially through the winter season, at a time of the year when eggs are of most commercial value, is equal to if not above the average of eggs laid by fowls in temperate climates. The egg production of pedigree laying stock is at least treble the amount laid by Indian hens. (2) Pure bred male birds, bred for egg production, have been crossed with village hens. The progeny resulting from these matings have produced double the amount of eggs of the original mothers and the size of eggs has increased from 1¼ oz. to 1¼ and 1¾ oz. each egg. (3) Feeding tests have been made and Indian foodstuffs proved to be economical and valuable for egg production. (4) Poultry diseases studied as far as possible and kept under control by sanitary measures. The invasions of ticks have been controlled, cholera and chicken pox and numerous other diseases investigated and kept at bay, and the experience gained has been published in books and bulletins. We have co-operated with the Imperial Bacteriologist and our United Provinces

Veterinary staff and are very grateful for the interest they have taken and the help given. They wish to do more but are hampered by lack of staff and means.

Our classes for students are a great feature of our work and are generally attended all the year round. During the cold season I lecture to the students each day when I am in headquarters. I am handicapped for want of a staff, as I have the entire Province to tour, besides the office work and all that it entails, and a great amount of my time is spent on the Farm supervising the work of the manager. The students are handicapped for want of proper accommodation and we badly need a hostel; in fact a training college well-organised on modern lines is the only satisfactory solution to the problem of meeting the demands of Indians for tuition in poultry keeping.

We give short courses for six weeks, but most of the students stay on for three to six months. Sixty students have been trained. We hold examinations at the end of each course and issue certificates if they obtain over 60 per cent. of the total marks; if they obtain over 75 per cent. they pass out in the first division. We charge only Rs. 25 for a six weeks' course for United Provinces students, and a slightly increased rate to pupils from other provinces.

Co-operation and assistance given to other Departments and individuals.—It would be impossible to give a full acount of the work we have done for the public but the following brief memo. will show that every province of India has obtained advice and help from us through its official department.

North-West Frontier Province.—We have stocked and started a poultry farm at Parachinar for Major Noel, Political Agent, and trained a Pathan to manage the farm. We have advised the Director of Agriculture also on poultry matters and supplied him with poultry and feeding stuffs.

Punjab.—In 1922 we advised the Hon'ble Mr. Cassels of the Punjab Government regarding a scheme to improve the poultry of the Province. Owing to lack of funds, this was not carried out. The Agricultural College at Lyallpur has received advice and stock from us. We have corresponded with the Director of Agriculture, Punjab, on various matters, and in February 1926 I gave a poultry demonstration and lecture at Gurgaon during the Agricultural Fair at the request of the Deputy Commissioner.

Bombay.—We have co-operated with Dr. Mann, Director of Agriculture, in the establishing of the first Government poultry farm in Bombay. We have sent one of our trained students to manage the farm and have stocked the same with pedigree birds and full equipment. We have advised the Livestock Expert fully on all poultry matters especially as regards the cost of holding an egg laying test on the lines of that held annually by the United Provinces Poultry Association.

Bihar and Orissa.—We have held several poultry demonstrations at the request of the Agricultural Department. In 1924 at Sonepur Fair we attracted much interest and many people in the Province expressed a desire to have a Government Farm on similar lines to ours. We have trained several men in poultry farming for the Bihar co-operative society, and we assisted last year at the opening of a farm by a Brahmin gentleman at Bhagalpur, also supplying a trained manager and pedigree stock.

Bengal.—We assist annually at the Calcutta Poultry Exhibition and co-operate with the Agricultural Department. We have trained an officer of the department to manage a poultry farm in connection with the Dacca Agricultural College, and supplied stock for same. We have also trained a student to manage the poultry farm at Bolpur in connection with

Dr. Rabindranath Tagore's village reconstruction work at Shantiniketan. We have also, at the request of enthusiastic Indian gentlemen residents in Calcutta, put up a scheme for a Bengal Government Poultry Farm to the Minister of Agriculture, Sir H. Stephenson. This scheme may soon materialise.

Madras.—We have advised the Agricultural Department on several occasions. We have also trained two men sent us by the National Council of the Y.M.C.A. and these men are doing valuable work in the Rural Reconstruction Institute at Coimbatore in teaching poultry farming.

Central Provinces.—One of our Brahmin students from the Central Provinces has opened a farm near Nagpur. We have advised the Agricultural Department from time to time.

Assam.—Have advised the Agricultural Department on poultry matters, and there is a keen desire in Assam to promote the industry if funds permit.

Burma.—We have advised the Agricultural Department and co-operated in sending stock to the Rangoon Poultry Show, and we have published a book on poultry farming in the Burmese language.

Indian States.—Kashmir, Bhopal, Gwalior, Hyderabad, Datia, Dhar, Nepal, Kapurthala, have all received either personal visits or letters of advice and help, as well as pedigree stock from our farms.

United Provinces.—Naturally the greater part of the Association's work has been done in the United Provinces. In co-operation with the Board of Revenue, we have started small poultry farms on various estates in the Province. Some of these are successful while others have failed, generally for lack of proper supervision. In co-operation with District Boards also small farms have been started and the birds sent to such centres have done a lot of good to improve the local fowls. We also organise poultry shows at most district fairs, at the request of the District Board authorities. We have assisted the Cawnpore Agricultural College to organise a poultry farm, and one of their officers is at present training under us. The Criminal Tribes Settlements in two areas have also started small poultry farms with our help. We are working in with the Girl Guides movement, hoping to interest the future generation. Missionary schools and colleges have also sought our aid. A great many private poultry farms have been started in the Province, but until some reorganisation of market conditions takes place they will find it difficult to get satisfactory prices for their goods. Pedigree breeders, however, make a good sum by selling eggs and birds of pure-bred varieties.

Last but not least, the Imperial Agricultural Department has been most helpful in our work and has published every year reports of our Egg Laying Tests and other information we have furnished. Under their ægis we read a paper on Indian Poultry at the recent Science Congress in Bombay, and the Agricultural Adviser has at all times given me his help and co-operation. As before mentioned we have received great help from the Imperial Laboratory at Muktesar, both with regard to research work on disease and also practically, for, in co-operation with the Imperial Bacteriologist we were able to manufacture a very fine sample of dried eggs from ordinary country eggs. This product is greatly in demand in the Western world, and would make a valuable export industry if the trade were encouraged and organised. As regards the general public, we have done our best to reply to every applicant. We only regret that the whole work is dependent on one person.

Lastly.—We are in co-operation, through the International Association of Poultry Instructors and Investigators, with workers in poultry husbandry all over the world, and receive information from the International Institute at Rome through the "International Review." As Member of Council for

India of the above Association, I hope to attend the World's Poultry Congress to be held at Ottawa next year and report on the small beginnings we have made in our efforts to improve the poultry conditions of this vast Empire.

Obstacles to Poultry Farming in India.—The chief hindrance to poultry farming is due to the fact that the Hindu population of India, with the exception of the lower castes, is not interested in the industry, in fact, it objects to it. This difficulty can be overcome in time by education and by the raising of the industry from the sweepers' task to the level of a specialised profession. I have had no less than fifteen high caste Brahmin students, and not a few have started farms of their own. At the Lucknow farm, no caste distinction is recognised, we all work together as equals. The objection to eggs as food has been lessened, on my explaining to orthodox Hindus that infertile eggs containing no germ of life are sold from the Farm for eating purposes and that the fertile eggs are used entirely for reproduction purposes. A simple fact like this, broadcasted all over the country, gives a different outlook on everyday things. As the standard of living improves, so the demand from the meat-eating population will become increased for eggs and poultry, and future generations will consume far more of these products than former generations. Besides, the interests of the minorities (and the large numbers of peasants concerned make no small figure) demand attention from those in power.

The ignorance and poverty of peasants themselves and their lack of kindliness towards animals as a whole are a formidable obstacle. We Europeans from childhood are taught to look on animals as playmates and friends, the outlook is different in the East. To remedy this every primary school should be taught to value and care for animals and have some simple project, such as a small poultry farm, included in their school education. I should also like to see agricultural propaganda work carried out by means of cinema films and illustrated talks to villagers. The cinema apparatus could be taken on lorries all over the country. With this end in view we have co-operated with the G.I.P. Railway in producing an educational film on poultry farming in India, and it is their intention to carry this film on a special carriage and show it throughout the country through which their line runs.

The susceptibility of poultry to diseases and difficult climatic conditions is another obstacle to progress. These difficulties can be met by scientific research and using our own experience and knowledge to evolve a race of fowls that will combine increased production with greater immunity from tropical diseases. Such a race I hope may be evolved in the future by taking the best the East can produce and mating it to Western high-producing stock.

The lack of good pedigree stock in the country is another handicap. This can be remedied by establishing poultry breeding areas in every Province. The fowl reproduces so quickly that five years would see the experiment completed. Another source of supply, which is at present being wasted and which could be utilised, is the large stocks of pure-bred males bred by Europeans, Anglo-Indians and Indian fanciers. All poultry farmers find they have a surplus of males, and these, finding no market at remunerative prices are killed off when quite young. These cockerels would do untold good if distributed amongst the villages for improving the local breeds. To breed with the improvement of stock in view would be a valuable hobby for the retired domiciled community to undertake. Owing to his being exploited by the dealers, the peasant gets a very small profit from poultry keeping. This reacts on the educated poultry farmer who grows better fowls and eggs. He has to compete with the bazaar article and finds it difficult to make his farm pay. If, by co-operation, the villager could secure fair prices he would be stimulated to increased production. There may even now be a surplus production of eggs that keeps prices low, if this is so I would suggest that

factories for the manufacture of dried eggs be encouraged. This industry is a very large one and in China brings in millions of pounds of revenue to the country. England alone spends 2½ millions sterling on Chinese eggs. The Western market will absorb an unlimited quantity of this product. With this end in view, either at once or in the near future the poultry industry of India might be encouraged so that within a few years' time it would bring in a very substantial increase of revenue.

Lastly, in all probability, on account of the above-named obstacles, the Government of India have not considered the poultry industry at all, but until they do there is little chance of any improvement.

Additional note on the development of poultry breeding in the United Provinces.

Efforts made by the Government of the United Provinces as regards poultry breeding.—In amplification of the report given above, it may be pointed out that the United Provinces Government have for the past six years given a substantial grant-in-aid of poultry breeding through the Civil Veterinary Department budget, averaging some Rs.20,000 per annum not including some non-recurring sums given to both the United Provinces Poultry Association and the Etah Mission Farm.

The major portion of this recurring grant is given to the United Provinces Poultry Association for the propaganda of poultry breeding in the Province, and they by the means of a well-equipped farm, training of Indian students in poultry husbandry, propaganda work such as illustrated lectures, visits to farms and an advisory correspondence bureau, &c., carry out this purpose of the Government.

The United Provinces Poultry Association staff consists of a Secretary on Rs.700 per month, a Farm Manager on Rs.300 per month and a clerk on Rs.125 per month.

Poultry shows for Indian and Anglo-Indian exhibitors are organised by the Secretary, United Provinces Poultry Association, at most of the agricultural fairs in the Province every year and substantial prizes in money or gifts of good breeding stock are given out to selected exhibitors.

Cross breeding with pure bred birds is largely in evidence in this Province, near all bazaars of our principal cities fair sized poultry are to be seen, and the country egg in this part of India is decidedly larger than the egg produced in other Provinces in India.

The United Provinces Government also contribute not less than Rs.1500 annually to assist the village poultry industry in Etah district conducted by Mr. A. E. Slater, an American Missionary.

It is an unique work and here the poultry industry is entirely developed for the benefit of the depressed classes, with most excellent results as regards the improved status of the peasants who have taken up the industry. If this work were done under supervision on a larger scale it should prove of great value in other districts.

The work has proved that pedigree Leghorns and Minorcas can become inured to village conditions and bring in good returns to the peasants keeping them.

The United Provinces Poultry Association do valuable work in educating Indians in poultry husbandry, some 76 students up to date have passed through our hands. The men when trained either conduct their own poultry farms or take posts as managers. A few have not made good and left the industry, but on the whole the results are promising and training is in demand from all parts of India, especially from Bengal and chiefly from amongst Brahmins and Mahommedans. We give preferential terms to our provincial people.

Being single handed, the Secretary finds it most difficult to carry out all the different activities efficiently.

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There is a very large demand from both within the Provinces and from outside for advice and assistance. Over 4,000 letters are written by the Secretary each year.

A few poultry farms have been established by the help of the United Provinces Poultry Association in various Courts of Wards estates in this Province, some have failed for lack of proper supervision and enthusiasm on the part of those in charge, others have done good work.

Most of these farms have come into being as a result of the propaganda work of the United Provinces Poultry Association, and as they continue to flourish, it is presumed they do good business, chiefly in the sales of breeding stock and eggs of pure-bred birds, for setting.

The table egg is provided by the country fowl and it is difficult for better class eggs to fetch higher prices in competition with the bazar egg and this is a grievance that is affecting the improved type of poultry farmer.

It would seem that India has more than a sufficiency of eggs for her own consumption and that an outside market should be sought for the bazar egg, so as to enable the better sized egg and fowl to find a local remunerative market.

Breeds chosen for experiment.—Experimental work has not been done to any great extent.

The United Provinces Poultry Association's farm was originally intended to carry out breeding experiments, but owing to financial stringency I was instructed by Government to make a commercial undertaking of the farm. Hence, as there is no demand for cross-bred stock at a remunerative price, the farm keeps only pure varieties, though a few experiments with crossing Chittagong and Rhode Island Reds, Brown Leghorns with country fowls and White Leghorns with Basra fowls are going on.

In Mr. Slater's village work he reports the Leghorn and Minorcas as the best birds for the villager to keep, owing to their active foraging propensities and their small consumption of food.

In giving out breeds at poultry shows to villagers, I find the heavy birds are much sought after, but they scarcely ever survive a hot season in the plains, the intense heat of the United Provinces' climate kills off the heavy varieties unless they are given special shade and shelter from the west winds and burning sun.

During the winter season from November to March, any good breed however will live, if fed and cared for, and will reproduce itself before death overtakes it in the hot season. The progeny of such matings are much more likely to survive, being more acclimatised.

In the Mirzapur and other districts very useful cross-bred stock has been bred during the cold season from birds given out from the United Provinces Poultry Association farm.

The following breeds have proved most useful on the Lucknow farm:—

Leghorns, all varieties.
Minorcas.
Rhode Island Reds.
Australian Black Orpingtons imported from Australia.
Light Sussex.
White Wyandottes.

All these breeds are bred most successfully and give abundance of eggs in the cold and rainy seasons and healthy progeny.

An egg-laying test is held at the United Provinces Poultry Association's farm each winter season, and entries from Australia, England, and all parts of India come in. Pullets are tested for production in single pens, and the winter egg records achieved equal records put up at other laying tests in other parts of the world.

We are unable to conduct a twelve months' test in this climate of the plains, but there is no doubt about the wonderful production pedigreed birds can put up in India, if fed and cared for correctly.

A full year's test is required, but money is not available at present for the purpose.

Indian feedstuffs are admirable for poultry and the raising of chickens very easily carried out during the cold season.

Conditions are more favourable than in Europe for this branch of the industry.

Disease is controllable, but the prevailing ignorance is enormous and lakhs of poultry die annually for want of knowledge in poultry-raising on the part of the owners.

Experimental work has been done in a general way only since the inception of the United Provinces Poultry Association in 1920.

There is urgent experimental work to be done if funds could be given.

Artificial incubation of eggs has been successfully carried out by me on the United Provinces Poultry Association farm, and an incubator made by us put on the market. We never use hens for setting purposes.

Preservation of eggs in water glass is highly satisfactory if due care is taken to keep the eggs constantly immersed, as the solution dries rapidly. This process, if taught to villagers would assist considerably in preserving their surplus eggs in the plentiful season.

Experiments versus disease.—The chief obstacle to poultry farming in the United Provinces is found in the attacks of parasites called ticks. We have used injections of soamin as an antidote to fowls so affected with complete success. We teach all we can with regard to this scourge, and have issued many leaflets and published books regarding the treatment of poultry diseases in English and the vernacular, but there is still a great deal to be done, and we have barely touched the fringe of this great problem. The means placed at our disposal are so small, and we have so small a staff.

Captain Hickey, Veterinary Adviser to the United Provinces Government is President of our Association and his technical knowledge and help is of great value to us.

Marketing—Table birds.—There is a very large market for the ordinary fowl and the Province is well situated as regards facilities for marketing.

The hill stations of Mussoorie and Naini Tal absorb large quantities of produce and the cantonments and big cities of the plains demand large supplies all the cold season.

Prices vary from Rs.1 to Rs.1-8 per bird and very fair poultry is to be found in the markets at the present time for the higher prices. Of course, compared to European table poultry the birds are small and flavourless, but matters are improving and better fowls all round exist, when we compare market conditions of twenty years ago. We attribute this to the increasing numbers of pure bred fowls that gradually find their way to the people, and if more breeding operations were carried out in centres of poultry production, still better results would accrue. There is no doubt that there is a lot of under-sized stock about and in country districts the eggs and fowls are still very small; it is near cities where European fowls are kept, that the improvement is most marked.

The method of packing table fowls for market is primitive and revoltingly cruel. The railway freights being so high, the people are forced to crowd numbers of birds in small low baskets.

The result is a great amount of suffering to the birds and death to a good many, especially as birds have to travel in hot luggage vans, no provision being made in India by the railways for the transport of poultry to market, in suitable ventilated wagons.

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The table fowl is sold alive in every case, no trade is done in cleaned and trussed fowls for table. If cold storage wagons and like facilities become available, no doubt this trade will change its customs accordingly.

Eggs.—The Market for eggs is very great and the chief centres are Lucknow, Rampur, Saharanpur, Aligarh, Meerut and Allahabad.

Mirzapur in the south of the Province grows large quantities of fowls, turkeys and guinea fowl and eggs for the Calcutta market, and some cross breeding work done by us through the Court of Wards farm in the Kantit Estate (Mirzapur district) has been successful.

Lucknow is a large collecting centre for eggs both for its own use and for the supply of Naini Tal. A rough estimate gives some 30,000 eggs per day as marketed in the flush season, November to March.

Five thousand eggs per day come by rail alone to Lucknow at this time.

The method of packing is ingenious.

Some thousand eggs without any packing material are carefully packed in layers in an ordinary country basket. Each egg dovetails into the next egg and the whole mass are tightly and cleverly wedged together.

As an indication to the railway transporting agencies, an empty egg shell is tied on the top of the basket and the consignment in most cases meets with very little breakage *en route*.

These baskets are non-returnable and form a cheap and efficient method of packing within the means of the senders.

From Saharanpur great quantities of eggs are sent to Mussoorie and Chakrata, one dealer reported to me he despatched 5,000 eggs daily.

In the summer season, the eggs are not fresh and methods of storage and preservation would be useful if taught to the people. A considerable amount of money is lost through the imperfect and slow methods of marketing.

Poultry breeders keeping pure breeds complain that they cannot get a really good price for their large eggs except by private sales.

Indian marketing of poultry products is controlled by the *khansama* or cook who is the purchaser on the one hand, and the middleman who is the seller on the other hand. Commission on transactions is usual, and unless this commission is forthcoming liberal business is not done. These conditions make it difficult for poultry producers to deal direct with the public.

Some scheme of marketing should be adopted through co-operative channels to bring the producer directly in touch with the customer.

If this were done, poultry farming would bring great relief to the peasant producer, as a subsidiary industry. Under the present system the middleman has most to gain.

There is no doubt that poultry breeding is very common in this Province among the Mohammedans, and low caste Hindu people and probably is more done than in any other Province of India except perhaps in Madras.

On the other hand the educated people of the Province are not interested in the betterment of this industry except in a few cases, and it has been uphill work to make any headway.

The Hindus are more orthodox and object to poultry on principle, whereas in Bengal and other parts of India many Brahmins even do not object to the industry.

We hope by means of increased propoganda work to overcome this prejudice and with this end in view have obtained by the kindness of the East India Railway a demonstration railway car fitted up as a model poultry farm wherewith to tour the Province. This car is meeting with good reception wherever it goes. We also have co-operated with the Great Indian Peninsula Railway in making a very instructive cinema film, which we are showing to the public on every possible occasion.

We anticipate far more demands on our resources and we only hope the Government of the United Provinces will back up our efforts with increased support both of money and men.

In the financial year of 1920-21, the gross receipts of the United Provinces Poultry Association farm amounted to Rs.2286-2-0, and in the year 1925-26 they amount to Rs.11.267-7-11, which shows an increase of some Rs.9,000. But it must be borne in mind that the farm is now conducted on a self-supporting basis for supplying stock birds and setting eggs to the public, and there is now scarcely any experimental work carried out.

Mr. Slater's village work also is successful as far as it goes but is also cramped owing to lack of adequate financial support.

Neighbouring Indian States are taking an interest in our efforts to promote poultry breeding.

We have trained a student from the Datia State and another man is now being sent us, in order that their poultry farm at Datia may be more efficient. I have personally visited Datia and given advice.

The Bhopal State has also sent us a student and I have personally advised the Begum and lectured in her State.

Gwalior State has also been in correspondence with us and sought our advice.

Nepal has sent one student to our training class.

We have supplied stock to the Kapurtala State also.

Many other Indian States too numerous to mention and further afield have also availed themselves of our technical advice and training and in several instances started State poultry farms.

Note on the Dried Egg Industry.

After several years of careful investigation into the dried egg industry as carried out at the present time in China and in California, I have come to the conclusion, in consultation with business men and agricultural officers of experience in this country, that this industry is one which might well be developed in India.

First, I wish to draw attention to the markets that exist for such a product and the prices realisable. Secondly, I would place before you the costs of production, and thirdly, the sources of supply in India.

Market.—I have ascertained that all the dry whole egg or dry egg yolk that we can manufacture in India will meet a ready sale in America if the price is low enough and the preparation up to the required standard, numberless biscuit and bakery supply houses in New York, Chicago and other cities of the U.S.A. sell waggon loads daily.

The trade has been established for the past ten years and is steadily increasing.

There is also a large demand for dried albumen for manufacturing purposes.

If we desire the same trade with Great Britain we can study her market conditions. Great Britain purchases annually 2½ million pounds sterling of Chinese eggs. These eggs enter England as egg in shell, liquid yolk and as dried egg powder.

I have a recent letter from " Pulvo " Limited, one of the largest British firms dealing in the dried egg commodity, who own extensive factories in China, stating that they have their eyes on India with a view to this trade, and they are only watching developments.

I also placed the possibilities of this trade before Sir D'Arcy Lindsay of Calcutta, a few months ago and he considered that the provisioning of ships with dried eggs is a trade worth our consideration.

He explained that milk is always carried in this form and if eggs were available at Indian ports in the same form it would be readily bought for culinary purposes.

He promised to look into the matter on his return to India.

Mrs. A. K. Fawkes.

Prices realisable.—In America 1 lb. of dried whole egg fetches 80 cents or approximately Rs.2-3-0 per lb.

I might here mention that 1 level table spoonful of this whole egg powder equals a 2 oz. egg and added to 3 parts of warm water becomes exactly like a liquid fresh egg and as such can be used in exactly the same manner as a liquid egg. That is to say the properly prepared egg powder is perfectly soluble in water and retains all the characteristics of the original egg.

A still higher price is realisable for dried albumen or white of egg which is used in printing mills for glazing papers, &c.

This preparation properly manufactured fetches as much as Rs.4 per lb. or $1.50 in America.

Cost of production.—It takes 50 Indian eggs to make 1 lb. of dry whole egg. The cost of drying eggs in China by modern machinery amounts to 2 cents or less than one anna per lb.

The cost of the latest type of egg drying machinery amounts to 15,000 dollars or Rs.41,250 landed Lucknow.

This machine is made in Los Angelos, California. It is capable of drying 2,000 pounds of dry egg powder per day.

The manufacturer offers to bring such a machine and instal it in Lucknow for half a lakh of rupees. He is confident that it will be followed up by many orders.

The sources of supply in India.—The price of eggs in India varies. After very exhaustive enquiries from many parts of India I have ascertained that eggs are cheapest and most plentiful in Chittagong where 25,000 eggs are available daily in the market.

One correspondent writes that eggs can be bought from villages in this district for as low a price as Rs.4 per thousand eggs.

In parts of Madras a correspondent offered eggs at a similar price.

Here in the United Provinces eggs are procurable in villages for from 4 annas to 6 annas per dozen; this is four times as expensive as in the rural areas I have mentioned above.

This rate, however, is an average rate for the greater part of India, or at least for those parts which supply large cities. Dealers in the bazaars sell at double and treble these rates to the public.

This flat rate of 4 annas per dozen however compares favourably with Chinese rates and is one quarter the price of fresh eggs in either America or Great Britain.

It would mean therefore a large margin of profit to the manufacturer of egg powder and incidentally make the egg producing business in India a most profitable one.

Now is the time to secure this trade, while Chinese trade conditions are at a standstill. This opportunity may not come again.

Objection may be raised as to the question of sufficiency of supply, for each factory will require some 50,000 eggs per diem to make it profitable.

This amount could very easily be produced by Indian villagers, and if once they found this number was required and if they got regular sales, they would soon produce more.

It is well known that poultry reproduce themselves in a very short time and a temporary shortage of eggs would soon adjust itself by more poultry being produced.

Another objection that may be raised is how the ordinary city market supplies would be met, if all village eggs are commandeered for the factories.

My reply is that the large army of unemployed young men could in a very short period start large poultry farms on modern lines and supply Indian markets with large and wholesome eggs and fowls at remunerative rates. It is the aim of this Association in this Province to equip men qualified to start such farms.

A dried egg trade would temporarily increase the cost of living and fetch for eggs a better price, this is all for the good of the industry and for the good of the nation.

I consider India most pre-eminently suited for the production of ducks and fowls on a very considerable scale. The experience of some 25 years in India has led me to this conclusion, and the latter ten years of my service spent exclusively in studying and experimenting on better and higher scientific methods of poultry farming have further impressed this on my mind.

In fact, it is not too much to say that in poultry farming lies a remedy for the present condition of the low caste and for the Mahommedan ryot and of his equally unfortunate brother, the unemployed though educated young men of India.

APPROXIMATE ESTIMATE FOR THE ERECTION AND UPKEEP OF AN EGG DRYING PLANT.

	Rs.
Cost of complete plant producing 2,000 lbs. dried egg per day of 10 hours F.O.R. Lucknow $15,000 ... ... =	41,250
Cost of competent engineer from America to install and put the first plant in operation	10,000
Building 50 × 50 feet with 15 feet ceiling	1,500

Net profit schedule.

Operation cost.

	Rs.	as.	ps.
100,000 eggs per day at 1 pice each	1,562	8	0
1 ton of coal	15	0	0
Lubricating oil ...	4	8	0
Three men at Rs. 1 per day	3	0	0
Dried egg containers (kerosine oil tins) ...	40	0	0
Label etc.	6	0	0
Freight to Calcutta on 2,000 lbs. dry egg ...	125	0	0
Freight to New York, U.S.A.	250	0	0
Overhead charges, Office, etc.	45	0	0
Rent of Land	1	8	0
Total daily operating expenses	2,052	8	0

Operating profit.

	Rs.	as.	ps
Sale in U.S.A. of 2,000 pounds per diem at Rs. 2 3 0 per lb....	4,375	0	0
Total daily operating expenses	2,052	8	0
Net daily profit ...	2,322	8	0
Net daily profit ...	2,322	8	0

Oral Evidence.

36,389. *The Chairman*: Mrs. Fawkes, you are Secretary of the United Provinces Poultry Association and you are engaged in the service of the Provincial Government, I think, in conducting certain investigations into poultry breeding and also in carrying on propaganda?—Yes.

36,390. For how long have you held that post?—Since the end of 1919, a little over seven years.

36,391. We have had from you and from other sources a certain amount of information on this subject; is there anything else you would like to say at this stage in amplification of what we have had in writing, or may we ask you one or two questions?—I am afraid I have a lot to say, if I may.

36,392. If anything occurs to you at the end of your examination, please say so?—Yes.

36,393. You realise that the Commission has had an opportunity of reading through the written matter, and it will not be therefore necessary to bring out your various points in oral evidence. Have you witnessed a good deal of progress in this movement since you undertook it?—Yes, I have witnessed almost, you might say, a revolution in the point of view of both Government officials and Indian public as regards the poultry industry since I came to India.

36,394. Do your activities extend throughout the Province?—Yes. It is, of course, a very big parish to cover.

36,395. Have you any organisation through which you can work?—Yes, I work through the District Magistrates; for instance, if I am going to a certain district, I inform the officer in charge of that district. I am also in touch with the District Boards, and when they hold exhibitions I either invite myself or they invite me to come and hold a poultry demonstration or a poultry show for the villagers or to give a lecture. In that way I am in touch with the whole Province through the official channels.

36,396. Would you say that, on the whole, the effect of your propaganda has been more marked in districts contiguous to your station here than at a distance?—I think it is fairly well spread over the entire Province. I have not visited the west of the Province so much as I have the other parts, owing to its distance from headquarters, and it may be that that part of the Province is not so much affected. I have not penetrated as far as I should like in every direction. I may say I am handicapped in propaganda work by having so much to do at headquarters, having no assistants.

36,397. I suppose you feel you could spend more funds?—Yes, I am cramped for want of means.

36,398. You may be surprised to hear that other witnesses think the same thing of their own particular fields of activity. In these various papers with which the Commission has been provided, there are statements as to the various markets which are open to Indian eggs. First of all, I want to ask you about the work of primary collection, that is to say, the organisation by which eggs are collected from the villagers and brought, let us say, to a town for local consumption in that town; how is that carried out in India?—That is carried out by means of dealers, *beparis*, who make house to house visits, collect eggs and bring them by rail, cart or coolie to the big towns and sell them.

36,399. Do they sell them to the shops in the bazaars?—Yes. There are certain egg merchants in the bazaars; in the Ahmedabad market there are ten or twelve such merchants, and they buy from their different agents in the country; these egg merchants sell eggs directly to the cooks and to the general public.

36,400. So that, as a rule, so far as eggs consumed in Indian towns are concerned, you have the primary collector, an intermediary and the retailer?—Yes.

36,401. Do you know at all on what margins of gross profit these various intermediaries operate?—I have made fairly extensive enquiries all over India, and I find that the villager gets a very small price for his eggs; in most places he gets about a pice an egg; that is an average price. I think the agent employs collectors and he makes the profit; he cannot possibly come and collect all his eggs himself; he is the contractor.

36,402. What does he get for the egg that has cost him a pice?—I think he gets an anna in the city.

36,403. So that you have to add to the pice the cost of collection and transport, and then the rest of the anna represents net profit to him?—Yes. Of course, it depends where he is marketing his eggs; if he is marketing them in a small town, he cannot ask the price that he can in Lucknow, Delhi or Meerut.

36,404. Have you any co-operative societies dealing with poultry breeding and the sale of eggs?—No, but I have approached the Co-operative Department here to try and help the very poor depressed classes of the Etah district in this Province who have a very large amount of eggs which we have helped them to produce; we have asked the Co-operative Department to assist us in marketing these eggs; correspondence has taken place, but I do not think anything tangible has been done yet; I am most anxious that something should be done.

36,405. It would appear to be a promising commercial opportunity for the co-operative movement, would it not?—Yes, because they could take the profits that the middleman is making and give more to the peasant, if it were worked properly.

36,406. And would another very important, and perhaps more important, aspect be the educative opportunity?—Yes, certainly. The better class of egg producers are coming to me and saying: "I have, as you suggested, taken up the better egg, but I cannot get a better price for it except by private sales to educated people who appreciate the value." The cook has nothing to gain by buying a bigger egg; he prefers to have his small village egg, which is cheap.

36,407. I understand that the cumulative effect of your experience put shortly is that there is nothing to prevent your developing a race of fowls very much more efficient as egg-layers and as table poultry than the ordinary indigenous breed which would also meet the requirements of the ordinary villager in the matter of disease-resistance, ability to look after themselves, and so on?—There is no difficulty if one is given the opportunity to develop such breeds.

36,408. Would one of the difficulties in popularising a breed of that sort be that, in the meantime, there is no prospect of the poultry breeder getting value for weight of egg, that is to say, for quality?—Yes, he will get the value from a certain educated portion of the community, but he will not get it as a general rule.

36,409. And your hope is that the educated portion of the community may grow?—Yes, and there is no doubt but that it is growing.

36,410. Is there a demand for table poultry?—There is a very big sale for table poultry in all cities.

36,411. And there again, are you experiencing difficulty in claiming price for quality?—No, I think that is easier, but that is not so largely undertaken.

36,412. I think the Commission is fairly familiar with the position as it is affected by the caste difficulty; I do not know whether you would care to enlarge upon that at all?—I should like to impress upon this Commission that the caste difficulty seems to be lessening since my propaganda work started, as the public interest has been aroused in regard to poultry farming. The students who are coming to Lucknow are largely Brahmins who wish to take up this industry; my present farm manager is a Brahmin by caste; a half to three-quarters of my Indian enquiries come from Hindus and Brahmins. If that can happen now, when a few years ago the fowl and the egg were absolutely unclean, I judge that education in these matters must be having some effect; it is realised that if fowls are kept clean there is a difference.

36,413. *Professor Gangulee*: Do you not get Mahommedan students?—I certainly get Mahommedans, but, as I say, the larger part of my students are Brahmins and Hindus.

36,414. *The Chairman*: Have you persuaded Europeans who live in the country to take up the improved breeds?—Yes, and especially the Anglo-Indians; they are very keen on it; most of the Anglo-Indian communities, especially railway employees and their families, make a little pocket money by breeding the better classes of fowl; I may say this is one of the sources of good poultry in this country, and through Anglo-Indians the industry is penetrating to other communities in India; nearly all Anglo-Indians are lovers of poultry.

36,415. Is Government either directly or indirectly subsidising persons willing to take up poultry breeding under your direction?—No, nothing is done in that way.

36,416. With a view, of course, to making such people agents for the distribution of the eggs of improved breeds?—No, there is nothing done in that direction; I wish there were. I might also add that there is a great deal of valuable poultry stock going to waste at the present moment. A great many Anglo-Indian people keeping good fowls have spare male birds and cockerels which they kill and eat; those birds would be most valuable if spread in villages.

36,417. I judge from your note that your advice is sought from many Provinces other than the United Provinces?—I may say that I am the Imperial Adviser at this moment; it sounds rather big, but I have letters from all over India, and I am trying to answer all of them. Until recently I have been the only official representative of this industry, and it is up to me to try and spread it.

36,418. But your own salary and the expenses of the station are being paid entirely from the funds of the United Provinces?—Yes.

36,419. Have you any views as to which Province after the Province which you serve is ahead in this matter?—I think Madras is ahead. I think that Bombay, with its new Poultry Association, is forging ahead, and Bengal is ripe for development; I think the Punjab also has appointed a poultry expert recently.

36,420. Would there be adequate supply of chicken food in India?—Yes, there is plenty of it.

36,421. I think we have from you in these notes a very clear account of your views as to the possible directions in which the Indian eggs might find the market. Is there any prospect of any experiments in egg-drying processes being made, you think?—I have brought this sample with me; it is made of village hens' eggs dried in this country; Mr. Edwards has very kindly prepared it at Muktesar in a serum dryer. It is rather an expensive way of producing it, but it proves that it is perfectly possible to dry eggs in India. The second bottle I have contains dried albumen; this is the quality that we must attain if we are going to capture the market for dried albumen.

36,422. I am wondering whether you can tell us whether there is any firm hope of a venture being made in the near future in this direction?—Yes. I think that if you, as a Commission, show the possibilities of the trade and the matter is made public, it will certainly be gone into by business men; I think it only requires to be broadcasted and known. In fact, several firms have already written to me from abroad, one being Pulvo Limited, as mentioned in my written reports, saying that they are watching the developments and are keeping their eyes on India in case anything happens to their Chinese trade, and that is why I am anxious that the poultry industry here should be developed in case such an emergency should occur.

36,423. Meantime, there is no export of either eggs or egg products, except in the shape of supplying ships for their voyages?—That is all that I know of.

36,424. You have studied the matter closely?—Yes.

36,425. Have you ever asked the Government of India for information?—I have asked officials. I know there is no export of eggs.

36,426. You take it for granted, do you?—Yes.

36,427. Have you sought information from the ports?—Yes, from Chittagong. There are no eggs going out except for provisioning ships and to Burma and Akyab.

36,428. Is there an importation of albumen into this country?—Yes; we are buying it at present, I believe, from Germany, in fairly large quantities for mixing with paints and for use in printing mills for paper manufacture.

36,429. Do your responsibilities extend to ducks and geese?—Yes.

36,430. Meantime, you are concentrating on chickens?—I am developing pigeons and ducks, both.

36,431. But not geese?—Certainly, I encourage geese; India already has geese. The Indian goose and the Indian duck do not require as much attention as the Indian fowl; it is more immune to disease and seems to get on very well in the villages.

36,432. It would appear that certain districts in Bengal are better suited to duck than chicken?—That is so, and the duck egg will be very valuable commercially.

36,433. Can you account at all for the fact that there are not many more domesticated duck in Bengal?—I think it is due to shortage of stock.

36,434. You have had a good deal of experience in these matters, and you no doubt have seen a good many persons in villages taking to poultry breeding who had not done so, at any rate on any informed or deliberate plan, before you persuaded them to make the experiments. Is the average villager capable of taking up a matter of this sort and carrying it on without constant inspection and encouragement?—Not if he is given imported European poultry, and not unless he is given a fowl immune to the village conditions; he is not capable of looking after the imported or better class of fowls; he can only look after his own kind.

36,435. Have you succeeded yet in producing a race of fowls which the average villager can look after for himself without advice?—No, because I have not been enabled to carry out experiments. I have simply been told to make a commercial business of the farm, which means I must sell birds which the public will buy. I have every hope of producing such a bird if I am allowed to carry on such work.

36,436. Unless such a bird is produced, it is difficult to say what service your activities can be to the ordinary cultivator in the rural district?—If I may say so, the present fowls that they already possess, if multiplied, would be quite all right for the purpose we have in view.

36,437. Have you attempted any improvement by selection of the indigenous breeds?—Yes, to a small extent; but there is a great deal more that could be done in that way. But for the purpose of the trade of which I am speaking, there are so many ordinary fowls already in the country that they could be used for the export trade without any further improvement; that industry could start at once.

36,438. *Sir Henry Lawrence:* We are told that the Indian breed at present produces about 60 oz. of eggs per year?—Yes, taking an egg at 1 oz.

36,439. The imported bird produces as much as 300 ozs.?—Even more than that. The English egg weighs double the Indian egg, 2 ozs., and the English bird produces double the number of eggs.

36,440. That only comes to 120 eggs and 240 ozs.?—Many English birds will lay even more. From 150 to 250 eggs per annum in some cases.

36,441. That is four or five times the production of the local fowl?—Yes.

36,442. Do you know why the various experiments made in India by the Agricultural Department and others have come to an end?—The chief reason has been the lack of expert knowledge; another reason is disease. In this present venture of ours we have discovered that it was the invasion of the tick that was the cause of most other ventures not succeeding.

36,443. Do you suggest that the tick disease and other diseases can be controlled?—Certainly; they are quite controllable.

36,444. How?—By teaching simple improved methods of sanitation, cleanliness and simple remedies.

36,445. Through what organisation would you give the villager these instructions?—I think we must have a poultry organisation of our own and teach by our own staff.

36,446. Through travelling Inspectors?—Our Indian-trained students, if they are in sufficient numbers, could form a staff to teach the villagers. By means of bulletins and propaganda we can do much.

36,447. But the villager must be shown in his own home exactly how the disease can be controlled?—Yes.

36,448. And you suggest that there should be a fairly large staff entertained by the Department of Agriculture in every Province for this purpose?—Yes.

36,449. You think that it is financially a remunerative proposal?—I certainly do, if we develop the industry. But I do not think we shall benefit India's revenues or benefit the position of the peasant by increasing the total number of eggs produced unless at the same time we develop a market for these eggs.

36,450. You could improve the food supply?—Yes; but I think we should be getting a very large amount of production without an outlet for it. Of course, there is this point, that the educated man is now taking to eggs and the demand for eggs is likely to grow, but not fast enough to make a sufficient outlet.

36,451. Do you know of any Indian breed of fowls which have been exported from India and have been bred and improved in England?—The species and genus fowl came from India; all birds have been originally developed from Indian fowls.

36,452. From what stock?—From the Indian game and from the Chittagong breed. The Chittagong was bred with Chinese varieties, and in ancient days even the Chinese get their species from India. India is the home of the fowl.

36,453. But the knowledge and experience of India has been lost?—It has been lost through neglect of the culture of it. In bygone days the trainers of fighting birds were people who knew all about fowls and who spread such knowledge.

36,454. In Western India was the Basra breed at any time well known?—A note was written by a police officer, of the Bombay Presidency I think, many years ago, and in that note he refers to the Basra breed; so that, it has been known in the western part of India for some time.

36,455. Was that breed ever imported into England?—I do not think it is known in England, but I will make it known now.

36,456. My impression is that it had been imported in former days?—Not to my knowledge.

36,457. *Sir Thomas Middleton:* From the producer's point of view, success in poultry keeping will depend on the possession of suitable breeds, abundant food supply and cleanly methods?—Yes, these are ideal conditions.

36,458. You have already indicated to us, especially in reply to Sir Henry Lawrence, that there will be no difficulty in getting suitable breeds in India, India being the home of the fowl, and the experience of those who have been keeping poultry in India in recent years is that good breeds, if not available, might easily be found for each district—Yes.

36,459. Next as to the food supply: you point out that India is singularly rich in suitable food grains for poultry?—That is so.

36,460. From your experience, which grains could you name as being the best for use?—A mixture of grains, but the cheapest grain is paddy in Bengal, *ragi* in Madras, and *bajra* and maize in this Province. All these are most useful. Wheat is very good for fowls, but it cannot always be provided as it is more expensive.

36,461. In fact there is a very wide selection?—Yes, poultry will take almost any grain.

36,462. In addition to that, there is in India a very large stock of natural food, is there not?—Yes, especially in the rainy season, when they live largely upon what they pick up from the ground; there is a great deal of animal food there to be obtained.

36,463. With regard to cleanly methods, it is only within recent years that we have appreciated the need for this in poultry keeping, and naturally your difficulty arises in getting methods demonstrated?—Yes.

36,464. Would it not be possible to use the demonstrators of the Agricultural Department to carry the knowledge of methods of disinfection, &c., to the villagers?—Certainly; and I think the Agricultural Department would do well to include poultry in their activities. Veterinary Assistants also would be of very great help, and it would be a good thing if each Veterinary Assistant in the Province knew something about poultry diseases.

36,465. Can you tell us whether any of the Agricultural Departments outside the United Provinces have been giving special attention to poultry in the last ten years or so?—Yes, they have been giving attention; in the Punjab a poultry expert has been appointed; in Bombay Dr. Mann, as Director of Agriculture, is furthering it a great deal because he thinks it is a valuable pursuit in famine tracts for his peasants; he has started a poultry farm in connection with the Agricultural College at Poona; and in Bengal they have now started a poultry farm at Dacca, with one of my students as manager.

36,466. Do you know whether anybody has attempted, by means of short special courses of instruction, to teach the demonstrators the essential points in disinfecting poultry pens and runs?—No; if they wish anyone thoroughly to be trained in poultry, they send him to me.

36,467. No short courses are being conducted locally?—Not that I know of.

36,468. *The Raja of Parlakimedi:* Apart from these Brahmin boys coming to your place to learn poultry-farming, are there actually Brahmins who have taken to this work?—Yes, I know of several Brahmins who have started poultry farms of their own.

36,469. In this Province?—The Raja of Marsan is of course a high caste Hindu. He has the largest poultry breeding establishment in this Province; Mr. Chatterji of Lucknow is a Brahmin and is starting in Lucknow itself; Mr. Pimpalkhute Rao, a Brahmin, has started a poultry farm at Nagpur and another Brahmin student has a farm at Bhagalpur.

36,470. Since this work started, have you kept any record of the farms that have come into existence?—Yes, we do keep a record of every farm that has started through our efforts, and of people to whom we have either given advice or for whom we have trained students.

36,471. Has there been an appreciable number of such farms?—Yes, a very large number of these farms have been started. My difficulty now is to stop people from starting farms. They want to start straight away without first obtaining knowledge of poultry-farming and I am so afraid they will fail.

36,472. Barring your place, are there no places where people can get themselves trained?—I think at Sangli there is an industrial school which is now taking in some apprentices; there is also one of my students in Dr. Rabindra Nath Tagore's Institute who, I hear, is wanting apprentices and I think in South India, at Coimbatore, another student is working there in the Y.M.C.A. for rural construction and he is also taking apprentices. But the only well-equipped farm in which we can give a full training is in Lucknow.

36,473. As regards the hybridized varieties of Indian poultry, what are the breeds of English poultry that you would suggest?—I consider the Leghorn fowl has proved its value in tropical countries for crossing with the indigenous fowl in order to improve such fowls.

36,474. Has it been tried?—Yes, I am closely following work in the Philippine Islands which is done by the American Government and they have succeeded in producing a fowl by crossing imported breeds with their indigenous fowls that can stand native conditions and yet is a good producer of eggs.

36,475. Has it been tried in India?—Yes, we have done it in Etawah district where we have a large number of such cross-breds, and these are giving very valuable returns to the villagers.

36,476. Are the eggs which are produced as good as, or about as good as, the eggs produced by the pure bred Leghorn?—Yes, the effect is really marvellous. The progeny produces double the number of eggs the mother produced and the size of the eggs at the same time is improved.

36,477. As regards immunity from disease, what is the effect?—The imported fowl is very susceptible to tropical diseases and that is a point which requires careful experiment in order to produce a fowl that is not susceptible to disease. That can only be done by using selected Indian breeds.

36,478. Are these crosses as good as their mother in the matter of resisting disease?—Not quite as good, but they are more immune than the imported ones and I think by the time we have obtained the third and fifth cross we shall get more immunity. That of course is a matter for experiment.

36,479. *Sir James MacKenna*: I was rather sorry that you did not include Burma amongst the more progressive Provinces?—Yes, I am sorry that I did not do so.

36,480. Do you see any possibilities there?—Yes, I think that if Government gave a helping hand it would be of great assistance. I have had many letters from Burma asking me for advice and, as you know, I have lately written a book in Burmese.

36,481. What is your view on development in the Provinces? Has the attitude of the Agricultural Department been sympathetic, and have the general public shown more interest?—The Agricultural Departments are most sympathetic, but they rather want a lead.

36,482. Yes, they want everything done for them. Do you think that poultry breeding should be taken up as a central subject by the Government of India?—I certainly think it should.

36,483. What could the Government of India do in the matter?—I think that they should adopt poultry breeding as one of their occupations in the same way as they have taken up dairy farming and animal husbandry. I consider small animal husbandry should not be excluded, and that attached to each agricultural farm there should be a poultry station. There should also be a central poultry institute and breeding farm with an experimental station.

36,484. Do you think they would have to open more than one farm?—I think that a central farm should be started first of all; and then the central organisation should make grants to the Provinces to enable them to start breeding farms.

36,485. What site would you select for your central farm?—I should think Bangalore would be about as central as any place I can think of.

36,486. How would the Government of India co-ordinate the work in the various Provinces from this centre?—In the same way as they are co-ordinating other work.

36,487. We have heard a lot about co-ordination and I thought that you might be able to help us in this matter?—I should be very glad indeed to draw up a scheme if you wish me to do so and if you would entertain such an idea. It could be done on the lines on which poultry development is carried out in England by the Ministry of Agriculture. They have a National Poultry Institute and they also have breeding stations where good eggs are available to the people at low rates. We could adopt that principle here in India.

36,488. Is there much research work waiting to be done in poultry?—Yes, Muktesar is very kindly assisting me in this matter; if they had a larger staff and means they could do a great deal more.

36,489. With regard to poultry diseases you say that such work should be taken up by the Veterinary Department?—Yes, and I would specially ask that research might accompany any work that is done.

36,490. What about the actual breeding?—That ought to be done by experts who understand Indian conditions.

36,491. On the local farms or on the central farm?—It should be first carried out at a central farm and from there spread to provincial farms, work being based on the experience gained at the central farm.

36,492. Have you any idea as to how the Government would finance this scheme? Would they put a cess on eggs?—I put up a scheme to my own Government in which, as we developed this industry, a small cess on the sale of eggs might be levied, in order to bring in some income to the Central Government.

36,493. Would it not kill the industry?—It would have to be done gradually.

36,494. Would you be in favour of a central All-India Poultry Committee?—Yes.

36,495. Would you have that separate or would you link it up with the Dairying Committee?—I would link it up with the Dairying Committee provided that the Poultry Committee was well represented by experts who understand poultry-breeding, and that such a Committee should not be swamped by people who were not poultry experts.

36,496. At home the channel for distribution is the grocer's shop?—Yes.

36,497. About your scheme for dried eggs, where would you allocate this factory? You want 6,500,000 eggs a year? Where do you think you would get these from?—I have made enquiries and have inserted advertisements in the Press asking for a supply of 50,000 eggs a day, and you would be astonished at the number of answers I received. I had an endless stream of letters offering to supply them. I made enquiries, especially round about Chittagong. I have ascertained that 25,000 eggs a day come into the Chittagong market. In the districts round the foot of the hills near the borders of Assam there are eggs almost going to waste. They tell me also that in Bolpur district, Bengal, the eggs are similarly going to waste, the villagers cannot get money for them. There are certain other places where there are ever so many eggs.

36,498. You do not think that there will be very great difficulty in building up an organisation to provide the raw material?—I do not think so. I think we could call for tenders for supplies for two to three years, to ensure our not having to pay high prices.

36,499. There is only one other item that makes one put the question. You are sure of the freight to Calcutta?—Yes; this is on facts that I have got from the local railway people.

36,500. Where did you start from?—From Lucknow to Calcutta. The freight to America is over-estimated; it was based on my own experience of the freight to England. Messrs. Balmer, Lawrie & Co. have since written to me to say that they will take a ton of this dried powder, in cases of 40 cubic feet content, for Rs.75.

36,501. Do you not think that, relatively to the transport to America, the railway freight in India is high?—Yes, but this is usual in every commodity; railway freights are far above the shipping freights.

36,502. Do you think that the question of railway freights is a matter that might be considered in the interests of the industry?—Certainly.

36,503. The figures are very striking?—The rates for live poultry are absolutely killing; they are strangling us; we cannot send poultry any distance. The railway companies measure the crates and charge accordingly, and in this hot climate we must give birds room to breathe; it is perfectly terrible how birds have to travel in hot luggage vans; it costs me more to send fowls in crates to Madras than it does to send a man; in fact, a man has to accompany them according to railway regulations.

36,504. *Professor Gangulee:* Have you been to Bangalore?—No, I have not been to Bangalore; I have only had a good many letters from the people there.

36,505. You say that you would like to see a poultry farm attached to the Imperial Institute of Animal Husbandry?—Yes.

36,506. Would you like to make the poultry farm separate from the Animal Husbandry Institute, or would you just have the poultry farm attached to the Imperial Institute of Animal Husbandry in Bangalore?—Poultry breeding is a specialised job; it is not a job for the dairyman to come and say how poultry must be bred; as long as we are independent in our organisation, we can certainly work in with the other animal breeding activities.

36,507. Is it your experience that there is a great deal of loss of village poultry through disease?—Yes; lakhs of poultry are lost through chickenpox and through fowl cholera, and all those losses could be mitigated.

36,508. Do you have any facilities on your own farm to carry on any experiments?—Very few, though, of course, we have learnt how to cure both ticks and chickenpox. If we had had an outbreak of fowl cholera, which, fortunately, we have not had, we could have got vacancies made at

Muktesar, such vaccines could be made available to the public in the same way as the cattle vaccines are.

36,509. Do you find that the village women are taking more interest in rearing better poultry?—I think they would do so if they were given the chance; of course, they are so very uneducated. When I go to Aligarh for the District Poultry Show, I have village women coming to me and begging me to give them a better class of fowls.

36,510. Are they Mahommedan women?—They are low caste women. They storm round me saying, "Memsahib, give us pure bred fowls." I have pure bred cocks, and I distributed and I give prizes for the resulting chickens that are brought back the following year. I have to turn many away, because I am not able to give them all they want, though they would gladly have them.

36,511. Women in villages, of course, have more time?—Yes.

36,512. If you could interest them, you could really lay the foundation of the industry?—Yes.

36,513. In your propaganda work, you make an effort to reach the women?—Yes; I have tried to interest by means of lectures and talks to *purdah* ladies too.

36,514. Of the Indian breeds which you have, the Chittagong breed has great prospects over others?—Yes. I am also very pleased with the Basra fowls that come to me from the western side; they came, I believe, originally from Mesopotamia; this breed has the stamp of a layer. The Chittagong is more a table bird, but I think it could be bred for laying too.

36,515. You said that there are plenty of eggs, and they are going abegging. It only strikes me that before you are able to stimulate poultry farming you must also provide better marketing facilities?—Yes, that is so; that is why I want a big export market for our eggs.

36,516. Better marketing facilities should then be considered as prerequisities to successful poultry farming?—Yes; both go together.

36,517. Have there been any experiments about packing, which is an important question?—The Ministry of Agriculture at Home (I hope I am well informed) have now made a crate compulsory which is non-returnable; a similar crate could be made cheaply in this country.

36,518. Of course, you will have to have some facilities from the railway authorities?—Yes, the railways must be approached at the same time. They do take eggs at a fairly low rate; it is for livestock that they charge such very expensive rates.

36,519. Would you agree with me that, in order to have better marketing facilities, the first thing is to have co-operative marketing societies?—Yes.

36,520. The second thing is a better packing arrangement, and the third is some concession rates from the railway authorities?—Yes.

36,521. Who are your best customers?—They are educated Indian, European, and Anglo-Indian poultry breeders. The villagers can do very little; what we give to the villagers is practically charity as I have to run the farm as a commercial concern, and I cannot do the work I meant to do for the villagers. Government started the farm as an experimental breeding station, but owing to financial stringency I was obliged to make a commercial success of it.

36,522. Are they prepared to pay a good price for your goods?—Yes.

36,523. About Mr. Slater's work at Etah, I understand he is teaching the villagers poultry farming?—Yes, and he has raised the status of about 15,000 people.

36,524. I am told his work is among the depressed classes?—Yes, but he is meeting with opposition.

36,525. Why?—Because the landlords do not always wish the depressed classes to be improved. For the last seven years, his poultry show in Etah has been the only thing of its kind there, but the local District Board this year I understand, are holding a rival show in Etah on the same dates. That is the attitude of some of the people of this Province.

36,526. The conflict is still going on?—It is going to occur at the end of this month. I cannot say if it is absolutely true, but I have heard about it.

36,527. Are the Slater Mission carrying on poultry breeding?—Yes. We give a small grant from our Government; I have also given out cockerels to them. It is a wonderful work they are doing, and it deserves to be well supported.

36,528. Are there any other missionaries carrying on the same sort of work?—In Sangli, in the Bombay Presidency, they are doing this kind of work; there are many missionaries now taking up this work, and finding it a very useful side line for their converts.

36,529. Do you find any Indian agency taking it up?—Certainly. Dr. Tagore has taken it up.

36,530. Are there any such agencies in the United Provinces?—The Salvation Army have taken it up.

36,531. They are mostly Christian missions. Are there any Indian agencies, like social service organisations, which have gone in for poultry farming?— The criminal tribes settlements in one or two places have started poultry breeding, and in places like Rori near Cawnpore, Bareilly and Moradabad they are doing it.

36,532. Do you charge any fees for training?—There is a nominal fee, and that fee is paid into the Association; students cost the farm a certain amount of money. We have to give them incubators, losses occur in hatching eggs, and very often the doors of poultry pens are left open by students and the breeding birds get mixed. I also have no hostel for the students; this is badly needed; I have to accommodate them in grass huts, which is not convenient. I need an officer to supervise and train the men.

36,533. *Mr. Calvert*: I am not quite certain about your own position. Are you Secretary to the United Provinces Poultry Association?—During Sir Harcourt Butler's time, I was brought out by the Government as Poultry Expert, and had a signed contract as such for five years. I had not been out from Home long when I found myself foisted as Secretary on this newly made Association, and placed in charge of a commercial business, which is not what I undertook to do. I have now no definite status, which of course makes it difficult for me. I am Secretary of the United Provinces Poultry Association, but supposing the Legislative Council in this Province is of the opinion that poultry breeding is not a good thing to encourage, I should be penniless. My salary depends on the vote of the Council. My present contract is worded "Provided funds are given by the Council, you are employed." It is a very unsatisfactory position.

36,534. Do you actually receive your pay from the Poultry Association, or from Government?—The Government make a grant-in-aid to the Poultry Association, and I receive my salary from the Poultry Association. The Association have no funds except those they receive from the United Provinces Government.

36,535. You are not a Government servant?—I am not exactly a Government servant, and yet I am, as Government pay me through the Association; I do not know how to explain it.

36,536. You draw your pay as Secretary and not as Poultry Expert?—Yes.

36,537. Are you connected with the Veterinary Department, or the Agricultural Department?—The Veterinary Department.

36,538. You say you cannot fulfil all the orders you receive. What is the obstacle to that? Is it the smallness of your farm?—Yes. I have not got the number of birds to supply them.

36,539. Is much use made of the demonstration car?—It has only been running for two months, but I have had crowds of visitors, and I have a good many letters coming from people wanting to start farms or buy eggs who have visited the car. In that way, it is going to be of very great help.

36,540. Does it go about the Province with you?—I meet it wherever I can. Being single handed, I do not leave my farm and my students for long; I have to dart in and out.

36,541. There is nobody else in charge of that car?—I have a student in charge of the car.

36,542. Would you be prepared to say how many fowls per acre in this country would find free food?—I should say 50 fowls per acre would find free food.

36,543. Without giving any grain?—It depends on the time of the year and the climate. You cannot make a general rule; in some months it is so dry that there is nothing living on the ground. In places like Bengal, there is always animal food and a certain amount of small seeds; there are also small fish procurable.

36,544. Then there would be practically no difficulty in the cultivator paying off his revenue, which is Rs.2 an acre, by keeping a few fowls?—None.

36,545. *Mr. Kamat:* With regard to the incubators on which you have to depend, have you taken them into villages and asked the villagers if they were able to handle them?—No. I am in touch with the villagers to a certain extent, because I go to big *melas* and district fairs, and there I have demonstration incubators and I show the chickens hatching; the villagers think I am a witch and can produce a chicken in half an hour. I think it would be too costly to take incubators to the villages, and also unnecessary. They have their own broody hens with which to hatch. I should not attempt to give the incubators to the villages, but only to commercial firms.

36,546. A few years ago, when carrying on propaganda on secondary occupations, I and a friend of mine carried an incubator with us. Everywhere we were told that if the scheme depended on the use of incubators, the villagers were not prepared to try it, because they could not regulate the temperature. Have you ever ascertained whether the villagers are willing to handle it and regulate the temperature?—I have had men to train who were almost villagers and who were possessed of very little education, and they were quite easily taught to use incubators.

36,547. At any rate in my case three villages refused to touch it?—I think it is only a matter of explaining to them a little more.

36,548. Is this poultry farm of yours making a profit?—No, because we are not trying to make a profit. We make it self-supporting, and whatever profit we make we put back into the farm, or use in giving prizes of money or birds to U.P. people.

36,549. I see from your accounts for the year 1925-26 that your receipts from the farm were Rs.11,000 and your expenditure on the farm also Rs.11,000 odd; in the previous year your receipts were Rs.10,000 roughly, and your expenditure about Rs.11,000?—The price of grain has a large

amount of influence on the expenditure. The price of grain varies, and the feeding of the birds is a large item in the cost of running the farm.

36,550. If a middle-class youth were to start a farm, would he have the certainty of commercial success?—No, because there is a very limited demand for the better class of egg. He can only compete with the village egg. That is what makes it difficult to make petty farming a commercial success.

36,551. So it would not be commercially profitable for a man to run a poultry farm as a private concern?—If he is in touch with a good market, it would be. With better class fowls he can grow double the number of eggs, but as a general rule they are not successful because they have to compete with the bazar egg.

36,552. About this scheme of drying eggs, Sir James MacKenna has drawn your attention to certain figures. I wish to point out one more thing in the same connexion. Your idea is to get a lakh of eggs per day, at the price of one pice each. You are getting eggs at the rate of one pice each now because the number required is so small, but when you have a factory requiring a lakh a day what will the price be, according to the ordinary laws of supply and demand?—I think a tender put out first of all in all districts where fowls are plentiful to cover a period of two years would cover that difficulty.

36,553. It is not a question of putting out tenders. Even if eggs are at the rate of one pice each in Bengal, if the factory is in Lucknow it is a question of transport and heavy demand?—We must start factories only in localities where we can get the number of eggs we want. I have given the maximum output. I do not necessarily say that a factory must have one lakh of eggs per day. You can start a factory with 15,000, but you will get a smaller profit.

36,554. What I wish to draw your attention to is this: You show a net daily profit of Rs.2,000?—Yes.

36,555. If the price of eggs goes up from one pice to one anna, your price for the raw material per day goes up from Rs.1,500 to Rs.6,000, a difference of Rs.4,500, and that wipes away at one stroke all the profit per day, which you say will be Rs.2,300?—Yes, but that is a very high price for eggs in India. I can go into the bazar and buy at less than that, as a retail buyer.

36,556. I am afraid that scheme has not been very carefully considered in view of the price which the eggs might jump to?—I think you will find poultry will be produced in such numbers that the price will go down again. It may be that the price will rise temporarily, and this will bring money to the peasant; the factories will be covered by tenders. The public can well afford dearer eggs.

36,557. *The Chairman:* Have you tried to discover what the expert opinion may be as to the smallest economic unit for this egg-drying plant?—A plant for 15,000 eggs.

36,558. *Sir Henry Lawrence:* Do you find that fowls are very liable to heat in the hot weather?—Yes, in these hot Provinces it is one of our problems. You must provide them with shade and ample supplies of water.

36,559. They can live through it?—Yes. There are exceptions; they may get heat stroke, but with ample shade and an ample supply of water they are very tenacious of life.

36,560. And how about damage by jackals and foxes in villages?—That is why we should develop breeds with the natural colours of the country, such as possessed by the *desi* fowl, which will roost in trees and save their own lives.

36,561. *Sir Thomas Middleton:* Why was your estimate made on this basis? Was this the smallest unit the manufacturers recommended?—Yes. They told me the greater the production the more the profit, and that for under 15,000 eggs it was not a commercial proposition.

36,562. But they recommended a machine of this size?—Yes. It can be turned on to drying milk and* other things if you do not want to use it entirely for eggs. The 100,000 egg machine is the smallest this firm makes.

(The witness withdrew.)

Mr. A. H. MACKENZIE, M.A., B.Sc., I.E.S., Director of Public Instruction and Deputy Secretary to the Government of the United Provinces, Education Department, Lucknow.

Replies to the Questionnaire.

QUESTION 23.—GENERAL EDUCATION (*a*).—Of the three grades of education referred to in the question, elementary education is the most important as a factor in the development of the agricultural efficiency of the people. At present, the condition of elementary education is very unsatisfactory. There will be no improvement worth the name unless we keep steadily in view the aim of elementary education. I need not give an elaborate definition of this aim. It will be sufficient for some time if we endeavour to build up a system by which boys will be trained to think for themselves, act for themselves, and read for themselves. In order to achieve these aims, we must always remember that how we teach is much more important than what we teach. Education is work carried on, not by systems, curricula or syllabuses, but by men. The first essential therefore is to improve the human agency which carries on the work of elementary education. We have, to begin with, the District Boards which control elementary education in rural areas. Generally speaking, the members have little real interest in education. They are far more concerned with personal questions—e.g., the promotion and transfer of teachers—than with the improvement of education. There are honourable exceptions, but it is rare to find a member of a District Board who, with public spirit and a belief in the value of education, gives time and thought to its improvement. Elementary education in the districts therefore dies from the top. The District Board Act should be amended in order to give large powers to the Education Committee of the District Board: on this committee there should be persons nominated by the Government—men with public spirit interested in education. Such men at present do not, in numbers sufficient to provide the agency for the efficient control of vernacular education, seek election to the Boards. The next need is to extend and improve the system of training vernacular teachers. Training classes, in particular, require better staff, accommodation, and equipment. If, by an improved system of training, we can make the teaching in preparatory classes efficient, a large increase in the number of teachers will be necessary to provide the staff for the consequent increased enrolment in classes III and IV. An increase in the staff will be necessary also in areas in which compulsory education is introduced. Also we require urgently an increase in the number of the district inspecting staff and an improvement in the pay and position of the chief district inspecting officer—the Deputy Inspector. Lastly, we need better school buildings.

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* The manufacturers put 100,000 egg size machines on the market so that expansion can be made up to this amount. It need not necessarily follow that 100,000 must be used per day, but under 15,000 eggs, it is not commercially useful and profitable.

It is impossible to expect educational work of value to be done in the dark, ill-ventilated, cramped hired houses in which many of our schools now meet.

All these improvements in the really vital matters will require much thought and work on the part of all concerned—Government, the Education Department, and the Boards. They will also involve large expenditure. In so far as agricultural efficiency depends on improvement in elementary education, it is vain to look for this improvement merely in the introduction of school gardens or rural subjects. There is no doubt that we could effect improvement by such changes in the curriculum (if we begin by introducing them in training institutions), but over-emphasis on their value is apt to do more harm than good by diverting attention from more vital needs and by encouraging the belief that real progress in education can be made by changes which involve little expenditure.

Middle vernacular schools are much more efficient than primary schools. The chief needs in regard to middle vernacular schools are more schools (to keep pace with the expansion of primary education) and better buildings, especially hostels. There is more scope and greater need in the middle school than in the primary school for changes in the curriculum. Efforts are being made in these Provinces to improve the middle school by the introduction of agriculture and manual training in the curriculum. Other changes aiming at linking up the work of the Education Department with the work of the Public Health and Co-operative Departments are under consideration.

(*b*) (i) We should improve the teaching of nature study in primary schools and continue our experiments in the teaching of agriculture as a subject in middle vernacular schools. We should also give liberal grants-in-aid and every possible encouragement to private bodies (e.g., missionary societies) which are dissatisfied with our present system of vernacular education and wish to experiment on new lines. The Education Department itself should continue its own experiments. For example, we may be able to introduce in the middle school some instruction in such subjects as co-operation, agriculture, and rural sanitation. We are now examining the questions, whether it is possible to frame suitable courses in these subjects, whether room for them can be found in the curriculum, and whether the type of teacher whom we employ in the middle vernacular school can be trained to teach them in such a way as to secure the attention of school boys, elicit their interest and develop their intelligence. Our aim is to endeavour to frame a curriculum which will interest boys in rural life, predispose them to agricultural pursuits and, at the same time, extend the range of their knowledge, stimulate their imagination, develop their minds, and give them permanent intellectual interests. It is difficult to frame this ideal curriculum (educationists in western countries are struggling with the same problem) and still more difficult to equip our inferior teaching agency with the gifts for teaching it. But we are fully alive to the need for making our practice conform more closely to our theory. On the other hand, this much must be said in answer to impatient critics of the Education Department—and they are not a few—that the only effective means of making boys contented with a rural life is to make the land attractive to them by improving the economic condition of the villager. To try to attach boys to the land by teaching rural science is much like trying to make them live good lives by imparting to them lessons in "moral instruction."

(*b*) (ii) The Primary Education Act permitting District Boards to introduce compulsory education in rural areas was passed by the Legislative Council only in February, 1926, and received the assent of the Governor General on April 21, 1926. No board has yet applied the Act. But the Education Department has published for criticism draft rules framed under the Act and has invited the Boards to apply for permission to introduce compulsory education. Government have agreed, provided funds are

available and are voted by the Legislative Council, to give the Boards which apply the Act assistance to the extent of two-thirds of the extra cost involved.

(*b*) (iii) The reasons are—

(1) The economic condition of the people. Parents need the services of even small boys for such light tasks as herding, gathering firewood, and nursing their little brothers and sisters in order to release their mothers for manual work.

(2) Bad teaching in the lower classes and lazy headmasters. Where there is efficient teaching in the infant classes and a conscientious headmaster, one usually finds good attendance in classes III and IV.

(3) Poor buildings. Over 7,000 of our schools are held in hired houses. These are of a kind which do not inspire any respect amongst parents for the work done inside them. "Work meanly housed is meanly regarded." It is significant that in an Indian village the building which commands most respect is the police *thana*, whereas in a Western village it is (next to the church) the school.

(4) Lack of schools with upper primary classes. Villages are usually separated from one another by dreary desolate spaces, often by jungle or ravines. Parents are afraid to send their children a few miles outside their own villages for education.

Oral Evidence.

36,563. *The Chairman:* Mr. MacKenzie, you are Director of Public Instruction in the United Provinces and you are a Deputy Secretary to Government?—Yes.

36,564. We have your note of evidence; would you like to add anything to that at this stage?—The main point I was trying to emphasise was that the chief need in regard to vernacular education is to make our existing schools better than they are; I think the way of improvement lies in doing better what we are now attempting to do, rather than making changes in the curriculum.

36,565. Would you, for the present, improve rather than extend the present system?—I should try to do both.

36,566. From your knowledge of this Province, is it your view that an increase in the literate population of the countryside would be of assistance in promoting progressive agriculture?—Yes, I think it would be of immense benefit; one way in which it seems to me it would be of assistance is that it would enable the people to utilise to advantage the literature which is produced by the Agricultural Department, and also I think that an efficient system of education would make the people receptive of new ideas.

36,567. And would probably enable the cultivator to guard his own interests more efficiently when he was in contact with either the market or the moneylender?—Exactly; and the petty Government official.

36,568. I assume that you regard literacy as the first objective of a system of primary education?—Yes, and not merely literacy, but literacy which is imparted in such a way as to develop the intelligence of the pupils.

36,569. Do you think there has been any tendency to overdo the notion of an agricultural bias in primary education?—I think so; there are many people who talk vaguely about introducing agriculture in the primary schools, but when one tries to get them to say definitely what they mean by it, it turns out to be very little that is practicable. Undoubtedly there is, especially amongst non-officials who are not educationists, an idea that there is something wrong with our system of education, and their remedy is to make it vocational. Only the other day in the local Council an Honourable Member got up and criticised our system of education because

it was not vocational; that has become a catchword; people entertain this idea quite honestly and in good faith, but they do not try to follow it up, to work it out in detail and say precisely what they mean by it. I myself have given a great deal of thought to this, and I have never yet met anybody who could tell me what vocational work could be done with any benefit in our primary schools. I remember discussing this with Mr. Moreland who was Director of Agriculture in the United Provinces; I said to him, "Tell me anything connected with agriculture which I can introduce in the primary schools and I shall try to introduce it." He thought for a long time about it and in the end he was able to give me only one lesson; that was a lesson on the method of sowing; we were to teach the children to sow in furrows instead of scattering the seed; that is all he could tell me.

36,570. How about the usefulness or the reverse of garden plots attached to primary schools?—I believe in garden plots for their educational value; I think through school gardening, if well and intelligently taught, we could develop in children a love of nature; I think we could interest them in outside things and we could use the subject as a means of developing their intelligence; but if it is to have these educational results, it must be well taught by men who believe in it and who are themselves interested in nature.

36,571. The giving of nature study lessons is not an easy thing to do, is it?—It is a very difficult thing; even in England one does not come across many teachers in rural schools who teach nature study well, and the man who does teach it well is the man who has a love of gardening; I think everything depends on the spirit of the man who is teaching.

36,572. Do you see any signs of that spirit amongst the teachers in primary schools in this Province?—Very few; I would not say it is impossible to find a certain number of teachers with the right spirit, but we must begin with the training institution and there try to interest the students under training. Attempts have been made to develop school gardening on a more extensive scale; for instance, we had one Collector who was very keen on it and issued the order that there must be school gardens; of course, these school gardens grew up rapidly; but as soon as he went, they died away just as rapidly. We must begin with the training of the teacher.

36,573. I see that on the first page of your note of evidence you point out that there is a certain lack of informed opinion on the District Boards. You suggest, I take it, that the Education Department should be placed in a position to nominate enthusiasts in education on the local Education Committee of the District Board?—Not the Education Department, but the Minister, the Government. I make a distinction. In the old days, before the Reforms, there was a certain amount of external control over District Boards exercised by the Commissioner, the Collector and the Education Department. The Boards resented that outside control, but now that we have a Minister responsible to the Legislature, I do not think in principle the Boards can object to the control of Government, because this Government is a Government responsible to the Legislative Council; therefore I suggest that on the District Board there should be a certain number of members nominated by the Government, and I do not think that this would be at all in conflict with democratic ideals.

36,574. Yes, I might have said the Government instead of the department. On whose advice do you suggest the Minister should nominate members on the local bodies?—I would not say he should do it on the advice of any particular individual; what happens now when the Minister has to nominate non-officials on bodies is that he acts to some extent on his own knowledge of suitable persons in the districts; he asks my opinion, or he may informally ask the opinion of the Collector or Commissioner. He gets his knowledge about men in different ways. If this proposal were adopted, I certainly would make my recommendations.

36,575. In the meantime I take it the position is accurately described on page 18, paragraph 3 of the Report on Primary Education for Boys in the United Provinces, with special reference to Rural Areas, which I see was prepared by the Assistant Director of Public Instruction, Mr. Harrop. Was that for the year 1926?—That was a special report.

36,576. It says: "The transfer of the administration of vernacular education in the districts to a body entirely and directly representative of local interests should theoretically have resulted in an administration better adapted to the needs of the districts, but this expectation has not been realised in practice"?—Yes, that is so.

36,577. Is that because of the want of informed opinion on the local body?—Lack of informed opinion and interest in education, and lack of energy to tackle the problems of education in the district. This report represents Mr. Harrop's own view; it is not a departmental view. He recommends an *ad hoc* body corresponding to the old School Board of England and Scotland.

36,578. This is unofficial to the extent that it represents the writer's own views only?—Yes.

36,579. Are you in favour of the creation of education committees *ad hoc*?—In theory I think a body corresponding to the School Board of Scotland would administer education much more efficiently than our present District Boards. But the practical objection, to my mind, to that proposal is that if we take away education entirely from the District Board we take away its most important function. It would leave to the Boards only public health and roads; and I doubt whether the District Board would then attract the type of men required for the general administration of the district. That is why I advocate a compromise in the Education Committee of the District Board.

36,580. It may be that the present arrangement tends to educate the District Boards as well as promote the education of the children; that is rather your view?—Yes; I think that in England, since the passing of Mr. Balfour's Act of 1902, since the abolition of the School Board in England, education has greatly improved; but there is this great difference, that education is practically left to the Education Committee of the County Council. Similarly one finds on the great City Boards of England that education is left almost entirely to the Education Committee of the City Council, the Board itself dealing with only broad questions of policy. So I would rather adopt the English system than the old Scottish system.

36,581. Have you considered at all the advisability of appointing some permanent secretary to the District Boards? Meantime they are conducted entirely by unpaid chairmen, are they not?—They have all paid secretaries in this Province.

36,582. Permanent?—Yes; they are District Board servants.

36,583. *Sir Ganga Ram:* They have also a District Board Engineer?—Yes.

36,584. Does he not act as Secretary?—No. They are separate officers, the District Board Engineer and the Secretary.

36,585. *Sir Henry Lawrence:* What is the secretary's pay?—Rs.300 to Rs.400 a month.

36,586. *The Chairman:* They are not educational secretaries; they are general secretaries, are they not?—Yes, they are general secretaries.

36,587. And there is no special staff dealing with the educational side?—We have in each district an educational officer who is called the Deputy Inspector of Schools who is the adviser of the Board in educational matters. He is a Government servant. So his position is rather anomalous. He and

the Sub-Deputy Inspectors, of whom there are four or five in a district, are the district officers of the department. At the same time, the Deputy Inspector acts under the control of the Chairman of the District Board as the Board's executive officer. I think that vernacular education would benefit greatly if the position of the Deputy Inspector were strengthened, if he was made a gazetted officer, and if he was *ex officio* secretary of this education committee which I advocate. Also I think he should have his own separate office to look to the details of administration. In the Punjab the office of the district inspecting staff is paid from Provincial funds and the clerks are Government servants. In this Province the clerks are all District Board servants, and for education we usually get the worst; those who cannot do anything else are put in the education office.

36,588. So that to that extent you have dual control?—Yes, we have. We supervise the schools through this Government staff, and at the same time the Board use them for their administrative work in education.

36,589. You regard that as the best arrangement in the present stage of development of your system?—Yes, with the modifications, I suggest.

36,590. On page 309 of your note, you say, "Efforts are being made in these Provinces to improve the middle school by the introduction of agriculture and manual training in the curriculum. Other changes aiming at linking up the work of the Education Department with the work of the Public Health and Co-operative Departments are under consideration." Have those suggestions been matured?—No. We have at present a committee consisting of certain officers of the department going into this question, and the idea I have in view is this: that we might, in the Normal School, impart to the teachers a course which would include instruction in such subjects as public health, the principles of co-operation and the main developments of the Agricultural Department; the object of that course would not be to equip these teachers for teaching these subjects in the schools, but to give them a background of knowledge which, I think, would be desirable in the case of men who are to teach in village schools. Whether we can devise a course which would be educationally sound and suitable for them is another question. That is what we shall have to look into very carefully; but that is the general idea at the back of our minds.

36,591. Do you think that a local schoolmaster may well be the secretary of the local co-operative society?—Yes. I know a little myself of the work that would be involved; but he is a suitable person for work of that kind if it does not interfere with his ordinary school duties.

36,592. I think there has recently been passed a compulsory Education Act in this Province?—Yes; it was passed last March, about a year ago.

36,593. That is a permissive Act applied district by district?—The Act permits a District Board in any area however small, even a village area, to introduce compulsory education.

36,594. Do you think the moment has come for compulsory education in this Province?—I think so, if the Act is worked in the right way. There is great waste at present in primary education as we mentioned in the memorandum which we submitted to the Commission. There is a rapidly diminishing enrolment from the infants' class to the higher classes of the primary school. Of every 100 boys who enter the primary school only 16 complete the full primary school course. So the first object of compulsion would be to ensure that the children who attend the school stay there until they get the benefit of it. The second object would be to ensure regular attendance. At present, even the limited benefit the child might get from attending the infants' class is lost on account of irregular attendance and I understand that in the Punjab, where they have introduced their compulsory Act in a large number of areas, the Act is being used primarily for the purpose of ensuring that pupils who are now at school will stay

there, not so much from the point of view of bringing in outsiders; that of course is the ultimate object, but in the Punjab I understand the Act is used for making the present system more economical by getting a better return for the money spent.

36,595. Have you ever considered the possibility of a scheme according to which parents will be in a position to contract in to a system of free education on the understanding that they would pay a certain fine if they take their children away before the approved moment?—I have never had that suggestion put to me.

36,596. The fine would be on a diminishing scale so that the longer the parent refrains from withdrawing his child the lower will be the fine, until it would finally disappear at the point where the system would be completely free?—I doubt very much whether it will work in practice. Even in Municipalities where there is a better educated public opinion than in the rural areas we find that it is very difficult to get the Boards to inflict any fines at all in their areas.

36,597. You mean the local authorities do not inflict the fines?—No; it makes the members unpopular. They ask for compulsion and as soon as they get it they make it ineffective, because they will not use their powers under the Act.

36,598. In the more backward tracts, any attempt to introduce compulsion will be doomed to failure, will it not?—I think it depends on the capacity and energy of the people who are working the Act. It does not depend so much on the children themselves as on the people who are working the Act and, while liberal exemptions must be given. I do not see any insuperable difficulty even in backward tracts in working a system of compulsory education. I think that was the experience in England when compulsion was introduced. The success of compulsion was not due so much to the willingness of parents themselves to have compulsion applied as to the fact that the people who were working the Act had the public spirit and the energy to insist on it being applied and the people had to respond.

36,599. *Sir Henry Lawrence*: What is the experience in any place in this Province where compulsion is now in force?—I find that it depends on the energy of the Board. There are some Municipalities in this Province where compulsion is being worked fairly well because the Board is not afraid of imposing fines; there are others where it is not working well because nobody will face the odium of levying fines; and in one Municipality where compulsion was a failure we threatened the Board and said that if they did not apply the Act we should consider the question of withdrawing it altogether. They did not like to face this alternative and they pulled themselves together, with the result that the next year the results were much better.

36,600. *The Chairman*: I do not quite reconcile your answer to Sir Henry Lawrence with what is stated on page 309 of your note: "The Primary Education Act permitting District Boards to introduce compulsory education in rural areas was passed by the Legislative Council only in February, 1926, and received the assent of the Governor-General on April 21, 1926. No Board has yet applied the Act."?—There are two Acts. There was one Act which was passed in 1919, that Act was for Municipalities and the Act passed in 1926 was for District Boards. We have compulsory education now to some extent in about 25 out of 80 Municipalities.

36,601. Then, to turn to your middle school system, you say at the bottom of that page: "Efforts are being made in these Provinces to improve the middle school by the introduction of agriculture and manual training in the curriculum." Have you made any changes recently or are you contemplating any changes?—We have actually introduced the teaching

of agriculture in ten middle vernacular schools and we propose next year to introduce it in ten more; the teachers for the additional ten are now under training. We have introduced manual training in fifteen schools and we propose to extend it to fifteen more next year.

36,602. How long has the agricultural training been in existence in these schools?—It was introduced only last year and we cannot say yet whether it is to be a success or not.

36,603. What exactly is the system in those middle schools?—We have a course in agriculture which was drawn up in consultation with the Agricultural Department. The subject is taught for about six hours a week in each of the classes V, VI and VII. We do not aim at turning out expert agriculturists but rather at giving a training in nature study on a big scale, a kind of training which will interest boys in agricultural work, give them, we hope, some respect for work done by the hands, and perhaps pre-dispose some of them to an agricultural life. They may wish to go to a school like the Bulandshahr school if they have been through a course like this.

36,604. Are those all middle vernacular schools?—Yes.

36,605. Are there any English classes in those schools?—In some middle vernacular schools, we have special English classes.

36,606. So that a boy might go higher up if he wished?—Yes.

36,607. Do you find the schools where English is taught very popular?—We have not had sufficient experience of them yet to say. There is undoubtedly a great demand for the teaching of English in middle vernacular schools and we now teach it in about 100 out of 500 schools.

36,608. In the case of the ten schools in which agricultural courses have been introduced, what land is available?—Five acres.

36,609. And stabling?—Just a shed.

36,610. For working cattle?—Yes.

36,611. One pair of bullocks?—Yes.

36,612. Are they on irrigated or unirrigated land?—Some on irrigated and some on unirrigated land. The sites are chosen by the Agricultural Department.

36,613. Is there a graduate of the Agricultural College attached to these middle schools?—No; we take an ordinary teacher from the middle vernacular school, that is, a man who has been through the middle vernacular school himself and has been two years at the normal school, and then we send him for a ten months' course to the Bulandshahr agricultural school. We choose a man who has had some connection with the land.

36,614. *Sir Ganga Ram:* Has he not taken a degree as Bachelor of Teaching?—No; he is just a vernacular trained teacher.

36,615. *The Chairman:* Is there a special course at that school for these teachers?—Yes.

36,616. So that they do not attend lectures at any College of Agriculture?—Only at the Bulandshahr school, which is the type of school which we think is the most suitable for the training. They take a ten months' course there.

36,617. Have you formed any view as to whether that training will equip these teachers to manage even so small a farm as one of five acres?—I do not think they will manage it well. I am not an agriculturist, but I do not think the training is sufficiently thorough for that. All I hope to do in a course like this is to interest boys in agriculture sufficiently to stimulate them to go on to a school like the Bulandshahr school and receive there a training which will enable them to manage small farms.

36,618. Do you not think that there is a possible danger if only five acres of land are attached to the school that the confidence of the people in the agricultural side of education may be somewhat shaken?—Yes; but if I find that, I shall recommend that they be stopped. I hope that this will not be the case. It is only an experiment that we are trying now.

36,619. Would you like to say anything about female education?—Female education is extremely backward. I think it has received very little attention either from the Legislative Council or from local bodies. I think that it has been greatly neglected. A great obstacle to progress is the difficulty of securing teachers. Another is the general apathy of everybody towards female education. I have been struck by the fact that during my six years on the Legislative Council there was not a single discussion on female education. One finds this apathy in the District Boards themselves. We offered the Boards to pay half of the cost of any scheme for spreading the education of girls; we offered half the cost of improving the pay of teachers, of buildings and equipment and of improving training facilities, but we got little response. I think the reason is partly the poverty of the Boards, many of our Boards being on the verge of bankruptcy; every thousand rupees tells; but there is also the general indifference to girls' education.

36,620. There are no lady members of Council?—No, I wish we had some. I do not think that women will ever come into their own until we get women members of Council.

36,621. That is not a matter in which your department can do very much, can it?—No.

36,622. Turning again to the report by Mr. Harrop, it is pointed out on page 47, paragraph 2 thereof, that "the problem before these Provinces is not as it is in the West to give adults courses of instruction beyond the elementary, but to make illiterate adults literate." And then, after setting out the arguments, the writer comes to the conclusion that "any attempt to spread adult education by means of subsidising teachers in rural areas for night courses would probably lead to disappointment"; and he suggests, in the circumstances, "the best course is to open schools for adults only where there is an assured demand for them. The scheme adopted by the Punjab of forming co-operative adult education societies offers the possibility of such an assured demand, and the scheme has been brought to the notice of the Registrar, Co-operative Societies, and the Education Department by the Oakden Committee on the co-operative movement in these Provinces." Do you agree with that view?—Yes, I do.

36,623. And then Mr. Harrop suggests also that night schools might be started as an experimental measure in the Normal Schools, that is to say, illiterate adults living in the neighbourhood of Normal Schools should have a chance of going in the evenings and receiving instruction? Do you agree with that?—Yes.

36,624. *Sir Ganga Ram:* Have you studied the latest method of rural education in the Punjab?—I have read the reports of the Punjab Education Department.

36,625. There we have started giving one year's course in the Lyallpur Agricultural College to all rural teachers, and a Normal School has been established there?—I think what they do there is this: they train at Lyallpur the teachers who are to teach agriculture in the middle vernacular schools, but not all teachers of rural schools.

36,626. I am not quite positive on that point; you may be right: anyhow, you have no such system here?—We have. We send our teachers not to the Agricultural College, but to the Bulandshahr School.

36,627. Are the Deputy Inspectors of Schools under your department or under the District Boards?—They are servants of Government in the Education Department.

36,628. If the Deputy Inspector was appointed as Secretary to the Education Board, that would mean that he would be serving under two masters?—That is so: but the present position is anomalous. At present he is to some extent under the control of the Chairman of the Board.

36,629. In the Punjab either the District Engineer is the Secretary or some honorary worker is the Secretary; and, of course, the District Engineer has his own department. I am only telling you this for your own information. I do not think that both the Secretary and the District Engineer are paid?—My suggestion was that the Deputy Inspector should be Secretary to the Education Committee only, and I believe that if he were made Secretary his influence for good in the district would be greater than it is now. At present he has to work through the Secretary of the Board, who is not an educationist. With regard to the question of nature study, you will pardon me if I tell you that the words "nature study" are not understood by the Education Department of these Provinces. Nature study means taking the boys out into the open fields and showing them the various kinds of crops and how the fields are ploughed. But simply providing five acres of land and a pair of bullocks to the school would only mean extra income to the teacher by way of affording him the opportunity of obtaining his kitchen vegetables free.

36,630. We have found that is the case, and therefore, we have not followed that process of attaching a 5-acre plot to each school. Nature study properly means that you should take the boys out into the fields for a walk, show them the fields, and the crops growing in them, and explain to them why the crops in certain fields are very well and in others they are not, and that sort of thing. The teacher who has received a one year's course ought to be able to know all that?—I do not agree with your definition of nature study although what you say is nature study may be included in the course.

36,631. You mentioned the difficulty of the cost of buildings. Can you give me any idea of the cost? Have you any standard plans?—Yes.

36,632. Have you studied the standard plans of the Punjab?—Not recently, but I studied them three or four years ago.

36,633. Do your plans differ much from those of the Punjab?—Not much.

36,634. Do your school buildings differ from those of the Punjab as regards the cost and the plan?—They are much the same. The cost of a primary school building in these Provinces, that will stand the weather and will not need continual patching, is about Rs.4,000.

36,635. I think I can tell you how to reduce it to one-quarter of that?—I wish you would.

I have got the plans from England, and the Punjab Government have decided to set up one school of each pattern as a model. I shall speak to you about it afterwards.

36,636. Do you know what proportion of the income of a District Board is spent on education? Is there any rule about it?—There is no rule about it.

36,637. They may spend the whole of their income on education?—The position is that the total expenditure on vernacular education is about Rs.90 lakhs a year, and the Boards themselves contribute about 30 lakhs.

36,638. That is for general education?—It is for vernacular education.

36,639. I only want to know whether there is any proportion which is laid down?—We have not laid down any proportion.

36,640. There are no Government rules as regards that?—No. In 1919, when we went in for a big scheme of educational expansion, we gave the Boards the whole of the extra money required, and since then, for

the improvement of the pay of teachers, we have given them the whole of the extra money required.

36,641. You made some remarks about ignorance about vocational education. We are also just on the threshold of improvement in that respect. One aspect of vocational education which is most necessary, which I have also represented to the Punjab Government, is to train the boys to draw to scale, so as to train their eye to the proportion of a thing. That can easily be introduced?—I do not believe in that for the primary school.

36,642. I am talking about classes above the middle school, the high school?—We have no high schools under District Boards in rural areas.

36,643. In urban areas, would you be in favour of introducing scale drawing?—To some extent. I would not lay too great stress on it.

36,644. Have you got the B. Com. degree here?—Yes.

36,645. Do you make any preparation for it from the high school upwards? —Yes; we have it in the high schools and the intermediate colleges.

36,646. You have no normal school for women teachers?—We have.

36,647. Can you not train a sufficient number to meet the wants of the people?—Not nearly enough for the needs of the country. The girls are not coming forward for this work in sufficient numbers.

36,648. Is that on account of sentiment?—It is not altogether sentiment. As you know, it is not easy for a girl to settle down in a town by herself and live alone.

In the Punjab we have started Hindu widows' homes for such teachers, and within the last four years we have spread 50 women teachers all over the Punjab. I get letters from some of my friends in this place, and even from the Benares University, complaining that our girls will not go to the other Provinces. If you have a Normal School on those lines, you can easily train them. Hindu widows require something to do, and I may tell you that we turn out 16 women teachers every year, and there is a still greater demand.

36,649. *Sir Thomas Middleton*: The administration of your work locally takes the same form as in England. You have got the District Board, corresponding to the County Council, and the Education Committee corresponding to the English Education Committee. But I understand from what you say that here the District Board gives much less po to the Education Committee than the Education Committee has in England?—That is so.

36,650. In England, the Education Committee is practically independent, except for finance?—Yes; in practice it is.

36,651. The County Councils do not interfere?—No.

36,652. To carry on the business in the same way as it is done there, you agree that it is essential that there should be a separate Secretary for the Education Committee?—Yes, undoubtedly. It would be an immense benefit to education if we had a separate Secretary.

36,653. Would you agree that the progress made by Education Committees in England is largely dependent on the fact that they have had very competent Secretaries?—Yes, and partly to the common sense of the English people, which has resulted in their delegating to their executive officers a good deal of power. In our local bodies the authority parts with power to its executive officers with great reluctance. Their whole time is taken up in discussing small questions of administration.

36,654. Whereas, in England the Education Secretary, in consultation with his Chairman, has great power?— Yes. It is a matter I specially looked into when I was last home on leave, and I ascertained that, although the Secretary has no statutory powers, in practice he has very considerable power in every one of the big educational bodies.

36,655. What salary will be required for your Education Secretaries in the United Provinces?—My proposal is that the present Deputy Inspectors be made Secretaries of these Education Committees, and that they be gazetted officers on salaries of about Rs.200, rising to Rs.500.

36,656. You say that your policy is to take up more rural schoolmasters from the families of real agricultural stock. Do you get any considerable proportion of them from agricultural stock in the United Provinces at the present time?—I should think we get between 80 and 90 per cent.

36,657. What about the quality of the men that you get from agricultural stock. Is it at least as good as you get from any others?—I should correct my statement by saying that the men are drawn from the rural areas. By agricultural stock, I mean men who have some connection with the land, not necessarily the sons of agriculturists. Their quality is as good as that of others.

36,658. We have heard the falling off of the attendance in the primary schools ascribed to poor teaching, apathy on the part of the parents and to the value of the boy's work to the parent. To what extent is the last, the value of the boy's work to the parent, important in the United Provinces?—I think it is of great importance, because the people need their boys for such tasks as herding and light tasks about the home.

36,659. And they want them for seasonal labour?—Of course, you cannot expect much labour from children of six to eleven, but they do little odd jobs.

36,660. Is any attempt made to make the school holidays coincide with the busy seasons in cotton picking districts?—We do. In our rules which we issue for the guidance of District Boards we say that the two principal holidays of the year should be given at the two harvests.

36,661. Do the periods of holiday in fact vary much in different parts of the Province?—No, not much.

36,662. We have heard, in some Provinces, that one great problem is the unemployment of young graduates. Have you got that as a serious problem in the United Provinces?—It is becoming more serious every year. Now that we have four Universities, and will soon have a fifth, the question of the unemployment of graduates is a serious one.

36,663. *The Raja of Parlakimedi:* Will not the efficiency of a school increase if you have better qualified teachers?—Undoubtedly.

36,664. You say that in certain schools the teaching is inefficient. Cannot they be forced to have better qualified teachers?—We do lay down that only teachers who are trained will be allowed to draw certain rates of pay, and by giving the Boards grants based on the qualifications of teachers we indirectly encourage them to employ trained teachers, but our system of training could be greatly improved if we had more money to spend on it.

36,665. Does not the Act here allow you to levy an educational cess?—No.

36,666. Do you not think that it would be a good thing to introduce such a thing?—I think it would be a good thing to get the money, but I doubt whether an educational cess would be a measure which would be supported by the Council.

36,667. Other Provinces are doing it?—It is rather outside my sphere, how to raise money. I need it badly, but I do not know how it should be raised.

36,668. Do you find the Local Boards evince much interest in the improvement of education?—My complaint is that there is not nearly enough interest on the part of the Local Boards in the really important problems of education. They are much more interested in such things as the transfer

of teachers and the promotion of particular individuals than in the real problems of education.

36,669. Do you camp out in the districts occasionally?—I have no time for it. I do visit particular places, but I have no time for regular camping, because I have to spend three months of the year in the Legislative Council, and the department is growing rapidly.

36,670. Were you able to move about more before the Reforms?—The Director then did more touring.

36,671. Do you not keep in touch with at least some of the headquarters? —Yes, I go to the headquarters of districts. I thought you meant regular camping with tents through a district.

36,672. Do you meet the Chairmen of District Boards?—Yes.

36,673. Have you tried to create more interest in education in such people?—I always tell them what I think the needs are.

36,674. Do you feel that that has some effect upon them?—I have not noticed any. I told the Council the other day that I thought education was dying in the districts on account of the apathy of the District Boards, and there were several members of District Boards present. I do not think that anyone disagreed with me on that. They all realise it. There are honourable exceptions, of course, and some of the Chairmen are keen men, but the average member of the District Board is, I think, not sufficiently energetic or interested in education.

36,675. In your jurisdiction have any of the Municipalities taken to this compulsory education?—Yes, 25 out of 80.

36,676. Are they working satisfactorily?—Some of them fairly so.

36,677. For how long have they been in existence?—For about three years, most of them.

36,678. Have any of them night schools?—We have night schools in about ten municipalities, about twelve schools in each.

36,679. Are they for adult education?—Yes, for illiterates over the age of twelve, who cannot attend the day school.

36,680. Is there a difference between the attendance at day schools and night schools?—Our experience varies. In some Municipalities, the attendance at these night schools is good: in others it is irregular. But on the whole in many Municipalities they are a success. The main reason for that is that they can be easily supervised; also the people in Municipalities are keener on attending, and the pupils are largely workmen who want to learn to read and write because this knowledge pays them in their work.

36,681. Are these night schools popular in those places where there is a demand for boy labour? I mean, on the last page you say that it is difficult to get boys for education because they are needed at home to help their parents. Do you think it would solve the situation if they had these night schools in those places?—I do not think they would attend.

36,682. Not even the night school?—I do not think so.

36,683. Do you think when their parents return, they will not be sent back to school?—I do not think so. I do not think there is such keenness amongst them for education that they would attend. It is either very cold or very hot in this part of the world, and the seasons between are the harvest seasons.

36,684. What are the working hours in the night schools, in the evening? —From 6 p.m. to 8 p.m.

36,685. *Professor Gangulee:* Does the Primary Education Act of 1919 apply only to Municipalities?—Yes.

36,686. Not to District Boards?—No.

36,687. So it was necessary for you to introduce another measure to enable the District Boards to introduce compulsory primary education in rural areas?—Yes.

36,688. On page 72, paragraph 348 of the Report on Agriculture in the United Provinces, you say the measure is the complement of the Primary Education Act of 1919? Are you referring to this District Boards Primary Education Act?—The District Boards Act is a complement of the Municipalities Act.

36,689. Until 1926, there was no Act which permitted the District Boards to introduce compulsory education?—No.

36,690. So you cannot really blame the District Boards for not taking an interest in compulsory education?—I have not blamed them on that account. It is too early yet to expect them to do so.

36,691. At the present time there are no primary schools managed by District Boards where they are trying to introduce compulsory education?—No.

36,692. Your experience of compulsory education is confined to the Municipalities?—Yes.

36,693. *Mr. Kamat:* Even now the draft rules under the Primary Education Act for the District Boards are still under consideration. They are not yet finally published?—They have been published now.

36,694. Only recently?—Yes.

36,695. Up till now the District Boards could do nothing because the rules were under consideration?—That is so. I am not quite sure whether I have not been misunderstood. I am not sure whether the suggestion in these questions is that I blame the District Boards for apathy because they have not introduced the Primary Education Act. I do not blame them for apathy on account of that. I blame them for apathy for not working the voluntary system efficiently.

36,696. *Professor Gangulee:* Do you agree that the voluntary system is really a very wasteful system?—Yes, because we get so few boys who complete the full primary course.

36,697. I should like to hear of your experience of primary schools in the municipal areas where compulsory education is being tried. First, with regard to attendance, do you find the attendance in these schools more regular than it was before?—Yes, in some of the municipalities it is.

36,698. Has there been any improvement in the quality of the teachers?—No, I would not say that they are better than our District Board teachers.

36,699. I am trying to compare your voluntary system with your compulsory system?—I think, on the whole, we have better teachers under the District Boards than under the municipalities.

36,700. So in the compulsory education system in the municipal areas they have teachers who are not up to the standard, if there is a standard?—Yes, that is an unsatisfactory feature.

36,701. Is the curriculum under the compulsory system any better than the curriculum under the voluntary system?—It is practically the same: the three R's, a little geography, and a little nature study where the teacher is competent, and physical exercises.

36,702. One of the features of the voluntary system is that instruction is worse in the lower classes, and from your description of the compulsory system as it is in vogue here in municipal areas, I find the same thing prevails, that the instruction is worse in the lower classes, because you

say your teachers are not up to the mark. The curricula are just the same?—Instruction in the lower classes is more difficult than in the higher classes.

36,703. That is so?—One gets children at different stages, and it is difficult to keep them all together, and teaching the elements is more difficult than teaching children in the third or fourth class.

36,704. Has any provision been made under this Compulsory Education Act for having any fund or cess to finance the scheme?—No. The Government pay the Boards two-thirds of the extra cost. The total extra cost to make the scheme universal in the municipalities of this Province would be another nine lakhs, of which Government would contribute six lakhs and the Boards three lakhs. It is quite a feasible proposition in the municipalities.

36,705. In Bengal we had to impose an education cess to meet that demand?—That, I think, is a proposal.

36,706. With regard to the agricultural middle schools, are they under the Education Department?—Yes.

36,707. Is there any middle school other than the agriculture middle schools where an attempt is being made to give some sort of agricultural training? I do not mean the sort of school you have in Bulandshahr; that is definitely an agricultural middle school. Are there no ordinary middle schools where some agriculture is taught?—These schools I have been talking about are middle schools teaching some agriculture. They are not agricultural schools.

36,708. How do these middle schools where agriculture is taught compare with the agricultural middle schools?—They have different aims altogether. The purely agricultural middle school aims at turning out trained agriculturists.

36,709. I know what their aims are. What I want to know is, whether the pupils take more interest in agriculture through going to these middle schools?—I cannot say, because we have not had them going long enough.

36,710. Who teaches agriculture in the ordinary middle schools?—A trained teacher who, after receiving his ordinary educational training, is sent to Bulandshahr for a ten months' course in agriculture.

36,711. Who teaches agriculture in the agricultural middle school at Bulandshahr?—A graduate of the Agricultural College.

36,712. On page 309 you talk of co-operation, of changes aimed at linking up the work of the Education Department with the work of the Public Health and Co-operative Departments. I understood you to say to the Chairman that there was a Committee appointed by Government to deal with that question. Is it still sitting?—Yes.

36,713. The report is not available yet?—No.

36,714. Until now there was no co-operation?—We have had co-operation to this extent, that we teach hygiene in our Normal Schools and we include a certain number of lessons in health matters in our ordinary readers. We have arranged to try experiments next year in adult education with the help of the Co-operative Department.

36,715. Have you any facilities for coming into contact with the educational authorities of other Provinces?—No. For the first time for many years this year all the Directors of Public Instruction met at Delhi; that was a very helpful conference.

36,716. Do you think such conferences are helpful?—Yes, very helpful.

36,717. It brings you in touch with what other Provinces are doing?—Yes.

36,718. Is that conference to be held annually?—I do not know.

36,719. Have you been to Moga?—No; Mr. Harrop went there on behalf of the department to see what they were doing.

36,720. Do you know of the experiment that is being undertaken in the Punjab with regard to the utilisation of the Co-operative Department for educational purposes?—Yes, I have read an account of what they are doing. They run many night schools under the general supervision of the Co-operative Department, but I believe they experience the same difficulty that I anticipate here as to regularity of attendance; I understand they had an enrolment of about 80,000 students at these adult schools in the Punjab, but less than 10,000 literacy certificates have been issued. It may be rather early yet to judge of the results.

36,721. *Mr. Calvert*: But 10,000 is better than nothing, is it not?—Oh, yes; but it seems to me that the system is wasteful; unless one makes most of these students literate the system is wasteful.

36,722. *Professor Gangulee*: What was the nature of the discussion at this conference which has just been held at Delhi; was it chiefly on rural education?—No, we discussed the Universities, secondary and rural education; we certainly talked a lot about rural education, but I think we covered the whole range of education.

36,723. Was it a combined conference of officials and non-officials?—No, it was only the Directors and some Ministers.

36,724. On what occasions do you have to approach the Education Commissioner to the Government of India; are you at all in touch with him?—No, the Government of India have very little control over education, so that we do not come in contact with him much.

36,725. There is not much contact?—No, there is no need for it now that education is a transferred subject.

36,726. Would you like to see such a relationship re-established with the Education Commissioner?—I think the conferences are very useful.

36,727. *Mr. Calvert:* Have you ever found a rural teacher weeding a school garden?—I have never actually seen one doing it, but I believe some do it.

36,728. Have you ever known a village teacher who keeps his own garden?—No, not in the way that an English teacher does.

36,729. They are not naturally inclined that way?—No; they have not a natural love of gardening.

36,730. One witness has given us figures for literacy in this Province during the last forty years; he has pointed out that in 1891 the literacy was 3·2 per cent., and in 1921 it was 3·7 per cent. Is that fairly accurate?—I could not say. These figures, I suppose, are based on the census.

36,731. Yes?—The figures that interest me more are the percentage of the school-going population at school rather than the figures of literacy.

36,732. But do you think this will be fairly accurate?—I should not like to say; I do not know.

36,733. Have you ever worked out the normal mortality among literates in the Provinces?—No.

36,734. That is to say the number you must replace every year to maintain the percentage?—No.

36,735. Compared with the number turned out by the fourth class?—No, I have not.

36,736. We have been frequently told, as you will be able to guess, that the curriculum in schools gives a boy an aversion to manual labour. The root cause might be in the curriculum, or the teacher, or the boy, or perhaps in the manual labour. Do you think the teacher or the curriculum have

much to do with it?—To begin with, I do not believe it; I do not think the curriculum does give a boy an aversion to manual labour.

36,737. That statement appears in practically every sheet of evidence we get?—I do not understand it. Our curriculum is not very different from the curriculum of a Board school in Scotland or England; one does not find the same charge being made there. I agree that it would be an advantage to have an element in the curriculum which would give boys a respect for work done with the hands, and one could I think have a subject like manual training in the middle schools, but I do not see what you could do in the way of manual work in the primary school, that is, for children between the ages of 6 and 11. I know that what you say is said by the great majority of people who talk about education, but I personally do not think it is a fair criticism.

36,738. It seems to be very difficult to get down to the root cause of that statement?—I think people assume that because boys are four or five hours in school they get a distaste for manual work. I do not see why it should be so; it is not so in my own native country.

36,739. Of course, the distaste might have been there first?—I do not see that you can expect much manual work from these little boys; they are little more than infants; I do not know what manual work people expect of boys between the ages of 6 and 11; they cannot do much more than herd the cattle, gather sticks and do a few little jobs like that.

36,740. You cannot suggest a royal road to avoid that criticism?—No; as I said, I believe our system of education would commend itself to the the people if we did well what we are trying to do.

36,741. You lay great stress on the teacher?—Yes, I think the training of the teacher is the crux of the whole problem of improving our elementary schools.

36,742. You know, of course, that in the Punjab we are trying to teach rural economy to the teachers so as to instil in them the best element of the Moga system. Is anything being done here on those lines?—As I said, we are considering whether we could have in our normal schools, with advantage, a course in what I think you call rural economics in the Punjab; the object of that course would be to interest the teacher in developments for the improvement of the villagers, and to make him sympathetic towards such movements, because he is usually the only educated man in the village.

36,743. Do you think your primary school teachers at present take any interest in village life?—I think so, in the way that everyone connected with a village does; as I said, 80 to 90 per cent. of them are drawn from the villages; they have village interests; but I want to go a little further; I want to give them a knowledge of what outside agencies are trying to do for the improvement of the villager.

36,744. You have probably read a book called "England's Green and Pleasant Land", in which it is said that the only hope for the English village now is in the village teacher. Do you think there is any hope in this country of making the village teacher the centre of all your uplift movement?—In time it will come. Do you mean on the lines recommended by the missionary deputation that visited India?

36,745. Something similar to that?—Yes, in time it will come, but I do not see that we can do much in that way until we have much better school buildings than we have at present. The school house should be the centre of these social activities, but about half of our school buildings are ill ventilated, damp buildings which are very unsuitable for any teaching purpose.

36,746. *Professor Gangulee:* If you had a good building, you could develop it into a community centre?—I think the provision of a good building must be the first step.

36,747. *Mr. Calvert:* Do you get girls attending boys' schools to any extent in this Province?—A fair number; I cannot remember the figures, but I should think we have got about 30,000 girls in boys' schools.

36,748. Under male teachers?—Yes.

36,749. That is quite hopeful?—The success of the scheme depends very much on individual officers; some officers are keen on it and it goes ahead in their Divisions.

36,750. Could you give a rough figure of the cost per pupil in the middle school?—It is about Rs. 23 a year.

36,751. And, adding on the extra charge for this agricultural teaching, what would it come to?—The annual cost of agricultural teaching, the recurring cost, would be about Rs. 700 a year; that includes contingencies and the pay of the teacher. There would be 90 pupils, 30 in each class; the extra cost of the agricultural training would be about Rs. 700 for the school.

36,752. So that this system of teaching agriculture in middle vernacular schools is not expensive?—No.

36,753. Is this agricultural teaching in the middle schools to be confined to the vernacular middle schools?—Yes. Although it is called agricultural teaching, I tried to make it clear that I do not regard it as teaching which will turn out trained agriculturists.

36,754. Do you think your department inadvertently encourages the leakage in the primary schools by laying stress on gross numbers on the rolls instead of on numbers in the fourth class?—How do you mean, laying stress?

36,755. In your annual reports commenting on the number on the rolls?—No, we are always drawing attention to the diminishing enrolment; we do not wish to hide it; it is one of the things we wish to advertise in order to make the Boards and others conscious of the fact that there is so much wastage.

36,756. The really important thing is the number of boys passing through the fourth class, is it not; that is what you are aiming at?—Yes.

36,757. Sometimes you point out in your reports that the number of boys on the roll has gone up by a certain number which represents so much per cent. in the year?—In other parts of the report you will find I am lamenting the fact that there is so much wastage.

36,758. In answer to the Chairman you were not very hopeful about a system of contracting in; I suppose you have heard of my experiment in the Punjab of compulsory co-operative education in which they all sign an agreement?—Yes.

36,759 I suppose there is no hope of that system being adopted here at present, is there?—I do not think so.

36,760. It is just to prepare the ground for the compulsory system?—I should doubt very much whether it could be adopted here.

36,761. *Mr. Kamat:* Speaking about manual work, have you had in this Province any idea of holding exhibitions of children's work?—Yes, we have exhibitions. Last year we had one for the Allahabad Division and two years ago we had one for the Agra Division; we have one for the Gorakhpur Division this year.

36,762. Are the exhibits sent up by the boys or girls fairly good?—Yes.

36,763. So there is a taste for doing manual crafts if there is some man of imagination to infuse such ideals in this regard amongst children?—

You mean as regards manual work? I think it must be done in a systematic way. I do not think merely holding exhibitions would be a sufficient inducement. We have got to train the teachers and supply equipment and so on.

36,764. Now about your suggestion in regard to school committees of the District Boards for promotion of elementary education? Since the passing of the Compulsory Education Act last year has this Province thought over the question of overhauling the District Local Board Act?—If you mean by Province the Government, no; they have not considered the question of amending the Act.

36,765. They have not considered the consequential amendments to the District Local Board Act involved by the passing of the Compulsory Education Act?—The Compulsory Education Act does not require any consequential amendments.

36,766. I am speaking subject to correction; but I think, in the Bombay Presidency, the Local Boards Act has been overhauled recently, and school committees, which you suggest, are now almost necessary for the promotion of elementary education. I wonder whether your Government has thought of the necessity of having similar consequential legislation for the District Local Boards?—We have not yet thought of legislation. The Primary Education Act was passed as the last Council was dying and the new Council has just come into existence. The Government have not yet thought of any new legislation.

36,767. The position has not yet been considered by the Local Government?—No; but we have decided to appoint a committee which will include members of the legislature and members of the Education Department, to examine the working of the education committees of District Boards.

36,768. Speaking of the Municipal Act, I believe under the constitution of the Act there is a provision for nominating a certain proportion of the total number of members by Government?—On the Board itself, not on the committee.

36,769. Yes, on the Board itself; it cannot be on the committee. Government have the power to nominate?—Yes, one or two.

36,770. Not one or two, it must be a definite percentage of the total number, say one-fifth?—The number of nominated members is two in the case of most Municipalities and in the case of four Municipalities one-third of the number of elected members.

36,771. The same thing happens in regard to the District Local Board Act. There again Government have the power to nominate a certain proportion?—They nominate two persons to represent special interests like the depressed classes.

36,772. And a certain number of officials?—No.

36,773. You have at all events the power of nomination?—Nomination to the Board to a small extent.

36,774. If it is the school committee, at least under the Municipal Act the Government has the power to co-opt an expert, say the Principal of a college or the Headmaster, on the School Committee; that is also allowed?—Co-option is by the Board, not by the Government.

36,775. Is advantage being taken of these provisions under the Act under the existing circumstances?—Not to co-opt educationists on the Education Committee.

36,776. In other Provinces this has been done for any number of years, as far as I know?—In this Province they do not co-opt any practical educationists on the Education Committee.

36,777. In fact even the idea of co-opting lady members has also been mooted in some Provinces and is very favourably considered?—It may be so.

36,778. With regard to your second suggestion for the training of teachers in Normal Schools, have you not got any training colleges of your own?—We have eight Normal Schools and we also have training classes in the districts.

36,779. Not a full-fledged training college?—The normal schools are training colleges for vernacular teachers. We call them schools. They give a two-years' course of training to students who have passed through a middle vernacular school.

36,780. So, when you speak of the improved system of training teachers you want some improvement in these Normal training schools?—Yes, and in the district training classes which give one-year courses for primary teachers.

36,781. But it is within the competence of your department?—Yes, if we get more money.

36,782. On the last page of your note you make a very interesting remark: "It is significant that in an Indian village the building which commands most respect is the police *thana*, whereas in a Western village it is (next to the church) the school". What is the pay you give to your village teacher here?—A trained teacher begins at Rs.15 and rises to about Rs.20 as an assistant master; as a headmaster his pay is from Rs.23 to 30; that is for the teacher of a primary school. An untrained teacher gets Rs.12.

36,783. In any case he gets less than a rupee per day?—Yes.

36,784. In England what is the average salary of the village school teacher, a respectable amount?—It compares well with that of a small shopkeeper.

36,785. That makes all the difference perhaps in the respect which they command in the village?—I do not think, having regard to the standard of living and to the pay of men of similar qualifications in other walks of life, that our teachers are paid badly. We spent recently 22 lakhs of rupees recurring in increasing the pay of our teachers. Before that increase they were badly off. I think their pay is now adequate; I have no complaint now about the pay of the teachers.

36,786. It all resolves itself into a question of more funds and more funds. There is another remark of yours: "The only effective means of making boys contented with a rural life is to make the land attractive to them by improving the economic condition of the villagers". Here again I think we are moving in a circle. We cannot send boys to the village because agriculture is not sufficiently paying, and agriculture is not sufficiently paying because educated agricultural graduates do not go back to the village. Can you suggest a method by which we can get out of the circle?—I have not been talking about agricultural graduates, but ordinary school boys who have passed the middle vernacular schools; educating these is not the only way to make agriculture pay.

36,787. Even for them is it attractive enough as the village conditions are at present?—I think if they can get jobs as *patwaris* or vernacular clerks they prefer them to the life on the land.

36,788. *Mr. Pim*: One of the methods suggested of meeting the difficulty of taking the boys away was the establishment of part-time schools. Have the experiments made in that direction been a success?—No; they have not been a success.

36,789. What are the crucial objections? Why have they failed?—Because the people who had sent their children to the school want them to go

full time. I do not think that they want half-time schools. If they send their children at all, they want them to get value for the money.

36,790. Had the prejudice of the teachers anything to do with it?—I do not think that the teachers were in favour of it. They probably knew that if the pupils left the school at half time and went home they would only loiter on the road; they knew that the boys were not required to work on the land but were only wasting their time.

(The witness withdrew.)

The Commission then adjourned till 11.45 *a.m. on Saturday, the 5th February,* 1927.

Saturday, February 5th, 1927.

LUCKNOW.

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.

Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Raja Sri KRISHNA CHANDRA GAJAPATI NARAYANA DEO of Parlakimedi.

Professor N. GANGULEE.

Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } (*Co-opted Members*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. F. F. R. CHANNER, Chief Conservator of Forests, United Provinces.

Replies to the Questionnaire.

QUESTION 19.—FORESTS (*a*).—Yes, it is believed that forest lands are being put to their fullest use for agricultural purposes. Wherever grazing has been reduced or excluded for the sake of forest preservation full justification is demanded not only by the Conservators concerned, but also by the Collector and Commissioner of the district. As all rules affecting grazing are scrutinised at every ten-yearly revision of the working plan, these matters receive ample attention. Our knowledge of the silviculture of trees and the ecology of grasses is insufficient for us to dogmatise on the effects of varying intensities of grazing either on the forest or on the grasses themselves, but, where there is a demand for grazing, all reasonable risks are taken.

(b) (i) *Plains and Bhabar forests.*—(1) *From existing reserves.*—The supply of firewood in rural areas depends greatly on the cost of transport from the forest. The forests of Gorakhpur division are an almost solitary exception to the general position, namely, quantities of unsaleable fuel left to rot in the forests. Special means of transport, such as tramways, are seldom profitable where firewood alone is concerned, and the only remedy likely to be of much value is the reduction of the rates charged for carriage of fuel by rail, which appear excessive and seriously curtail export. These rates adversely affect the export of charcoal and bamboos as well as fuel, and the Commission are invited to examine the figures given in the Utilization Report of this Province for 1925-26, a copy of which will be sent as soon as it is received from the press.

The supply of fodder in rural areas is again a question depending considerably on freight charges and, as in the case of fuel, the margin of profit is too small to justify the introduction of expensive tramlines and the like. The freight charges for grass are such that it becomes unprofitable to rail it more than 50 miles, even though it be baled. It seems,

therefore, that little can be done to increase the supply from existing reserves.

Before, however, any extensive benefit could be obtained by reduction of transport costs it would have to be ascertained that the villagers concerned would be willing to pay the reduced price or any price. My experience is that cowdung owned by a villager will be burnt before he will pay anything at all for wood fuel. In fact, villagers who can get free fuel sell their cowdung to villagers who cannot get it.

(2) *From unreserved waste land.*—In districts such as Agra and Etawah we have large tracts of bare ravine land producing little grazing of value and no grass. By the protection and partial afforestation of such lands large quantities of grass are produced which must be a great asset to the local population. In fact, mere protection without afforestation is sufficient to rapidly improve the existing scrub and enable the soil to produce good crops of grass. It is therefore suggested that more attention be paid to ravine lands and that protection, apart from any scheme of afforestation, be extended on a much enlarged scale. Whether reservation under the Forest Act would in such cases be essential, is not certain. The areas would in any case be divided up into blocks, which would be opened and closed to grazing in rotation. The most satisfactory rotation would only be ascertainable as the result of experiment. Though the question of ravine lands has been especially mentioned, there is often, quite apart from the ravine country, considerable waste land where something might be done. Such plantations and fodder reserves should be the property of the villagers; in fact small communal forests. All labour should be supplied free by the villagers themselves and the work controlled by the civil authorities under the advice of the Forest Department. Such communal forests by providing small timber and fuel as well as fodder grass should allow manure, which is now largely used for fuel, to be used for fertilising the soil, provided of course they do not sell it to less fortunate villagers. The villagers might in many cases be induced to take an interest in the work by combining the formation of forests with the growing of field crops on the system known as *taungya*, a word borrowed from Burma. Forests which have been clear felled are being re-created successfully on this system in the Gorakhpur forest division at small net expense. Also where irrigation is practicable, the difficulty and expense of creating forests will be much decreased.

(ii) *Forests in the Kumaon hills.*—In the hills there are considerable tracts almost entirely devoid of tree growth. Lack of fuel and fodder is much felt in such places, and the few enclosed plantations so far made are frequently much valued by the neighbouring villagers. There is, in fact, some desire for extension of these plantations. It is therefore suggested that in bare tracts there should be further co-operation with the villagers in the establishment of plantations to increase the supply of firewood and fodder.

(*c*) Deterioration of forests has led to soil erosion in instances too numerous to record. There are, however, degrees in soil erosion and the more numerous cases of slight erosion of the surface soil may be capable of rectification within a few decades if the cause of deterioration is removed. Under this class may be included thousands of acres of forest in the Kumaon and Garhwal Himalaya, where heavy lopping (principally of oaks) and excessive fellings are still causing deterioration of the forest and soil erosion. These remarks apply mainly to class I reserved forests, over which the Forest Department have now no control.

The more serious cases of soil erosion, in which the whole surface of the soil is laid bare, and vegetation is reduced to scattered tufts of grass or shrubs, are practically confined to areas of waste land outside the limits of reserves. The most notable cases of such erosion have taken

place along the banks of the Jumna and other large rivers and have resulted in the formation of thousands of acres of bare ravine land.

The obvious remedy in the case of soil erosion resulting from the deterioration of forests in the Kumaon hills is control by the Forest Department of lopping and felling somewhat on the lines laid down at the original forest settlement of these tracts between 1911 and 1920. The present unsatisfactory state of affairs is due to the serious unrest which the 1911 settlement gave rise to, leading to the recommendations of the Kumaon Grievances Committee.

These have been in operation for the last five years and in accordance with these recommendations control by the Forest Department over vast tracts of forest was entirely removed. It does not appear to be a practical proposition to revert to control, except in so far as it receives the support of public opinion.

In the case of ravine erosion along the banks of the large rivers, the only remedy is the protection of the surface soil by the prevention or adequate control of grazing. To this end the lands may be reserved under the Forest Act with afforestation as its ultimate object. This has been done already for a fairly large area in the Jumna basin. But, as hinted in the reply to question 19 (*b*), afforestation is not essential if the only object is the prevention of erosion. Adequate protection afforded by the prevention or control of grazing is sufficient for this purpose.

Soil erosion also occurs in parts of the reserved forests where the ground is not flat or nearly flat, and grazing is excessive locally.

(*d*) It is believed that the supply of moisture in the soil and the rainfall cannot be increased by afforestation or increased protection of forests so as materially to benefit agriculture. It is not to be inferred from this that afforestation does not result in increasing the moisture in the soil within the forest, but merely that this cannot be expected to affect the surrounding cultivation to any measurable extent. That afforestation increases the moisture content of the soil has been amply proved in the ravine reclamation work now being carried on in the Afforestation Division, where it has been stated that the moisture penetrates to a depth of 12 feet in areas where it previously penetrated as many inches.

On the other hand, the supply of canal water can almost certainly be improved by increased protection of hilly forests notably those of the Kumaon and Garhwal hill tracts. In order that agriculture may derive its maximum benefit from canal water, the supply of water must be constant and, more specially, should not fail during the dry months of the year. The rivers from which the canals in this Province derive their water all rise within the Himalayas and the supply of canal water must depend very largely on the deterioration or otherwise of the forest. Destruction of the forest spells erosion, leaving the soil bare so that a rapid run-off of surface water takes place and there is little conservation of moisture on which the springs can rely during the dry months of the year.

The increased protection of the hill forests recommended above would also to some extent prevent the erosion of agricultural land since the tendency would be to prevent floods due to a too rapid run-off during periods of heavy rain.

The afforestation of the ravine lands near large rivers already mentioned above would have a very marked effect in preventing destruction of agricultural lands which are being visibly eaten into by ravines. Afforestation in the Etawah district has prevented the extension of some ravines but, where the land is cultivated right up to the ravine, the villagers will not agree to afforestation round the head of the ravine and erosion continues.

(*e*) As already mentioned under (*b*) and (*c*), there is an opening for schemes of afforestation in the neighbourhood of villages especially where

there are border ravine lands similar to those of the Etawah district. We are at present afforesting 2,000 acres per annum of such land with results which cannot fail to be of the greatest value to the local agriculturist in that:—

(i) Further erosion of agricultural land is prevented.
(ii) A local supply of fuel is created.
(iii) The grazing is much improved in quality if not in quantity.
(iv) Large quantities of grass are grown where previously none existed.

It would probably be unwise immediately to increase largely the area annually treated owing to the number of silvicultural and economic problems which still remain unsolved and which can only be overcome by patient scientific investigation extending over a number of years. Such problems include the selection of species best adopted to varying conditions of soil and climate (frost is a local factor of importance), the cheapest and most profitable methods of preparing the soil and sowing the seed, the value of the produce when grown, the yields that may be expected and the extent of local consumption. Errors of judgment in any of the above matters may prove very costly and will be the more so larger the area involved.

In Kumaon, also the need for afforestation has been noted under 19 (*b*). The possibility of combining this with some form of communal forest management is being studied. At present an officer has been deputed on special duty to study the communal forests in Madras where they are reported to be an extensive and generally successful feature of forest management. Since the inhabitants of Kumaun resent any interference with their destructive habits, progress will have to be slow. As a rule the hill man only realises his need of forests when he has entirely destroyed them.

(*f*) (i) *Plains and Bhabar forests.*

(1) The more valuable *sal* forests.

Generally speaking, these forests are not suffering to any appreciable extent from excessive grazing. There are of course exceptions, but as soon as damage becomes serious, the obvious remedy of reducing the incidence of grazing is often possible.

An exception occurs in the *sal* forests open to rights near villages along the boundaries of the Ramnagar, Kalagarh and Lansdowne divisions in the Naini Tal and Garhwal districts. These forests are rapidly deteriorating, as for instance near the Kotah Dun and Patkot. In such areas, it is not only impossible to obtain natural regeneration, owing to the trampling of cattle but the villagers obtain no real benefit because the trampling destroys the grass and there is no fodder to speak of. Closures however merely create fierce local resentment which, even if withstood, reacts most unfavourably on the comparatively friendly relations between the people and the Department which are essential if forest protection and utilization are to be successfully conducted. In such cases, the only remedy seems to be the education of the people to the fact that a few well-fed cattle would do far more good to the cultivators in every way than large herds consisting of animals of the poor type now existing. The desideratum is controlled breeding and grazing fees on a scale which would make the cost of an animal's feed bear a proper proportion to the profits it brings an owner. For example assume that the market value of a herd of 100 head is Rs. 10,000, the owner's net profit at 5 per cent. should be Rs. 500, say his revenue is Rs.1,000 and his other expenses are Rs.100 then he can afford Rs.400 for forest grazing—Rs.4 per head. Such figures could only be applied to purely commercial grazing but nevertheless all grazing in forests should be on a business basis. What is free or of little value is never appreciated and it is largely the low cost of forest grazing which leads to the existence of these large herds of inferior cattle which in their

turn lead to ever increasing demands for more free (or cheap) and inferior grazing.

(2) Less valuable miscellaneous forests.

These forests differ from those maintained solely as grazing grounds in that the timber and fuel is of equal or greater value than the grass and grazing. They occupy an intermediate position between the better protected *sal* forests and the open grazing grounds. In some of these lands deterioration is certainly taking place; partly on account of the grazing which is often heavy, and partly on account of ceaseless lopping and felling either for fodder or for making temporary huts, etc. As a special example may be cited the outer fringe of hills west of Ramnagar in the Naini Tal district. The only remedy in such cases is some curtailment of the incidence of grazing on the lines proposed above.

(3) Areas maintained mainly or solely as grazing grounds.

Cases of serious damage due to excessive grazing are commonest in lands which are being maintained solely or mainly as grazing grounds for the benefit of graziers. The forest officer can usually succeed in persuading the revenue authorities as to the harmful results of excessive grazing in areas where valuable timber is being grown, but he finds it very much more difficult to prove the deterioration which is taking place in areas maintained as grazing grounds. Nevertheless such forests as Bhinga in the Bahraich Division and certain grazing grounds in the north of the Gorakhpur Division, where grazing is permitted during the whole year, have undoubtedly deteriorated very considerably and are still deteriorating. The remedy again in such cases is to reduce the grazing incidence and to give the grazing grounds periods of rest.

(ii) *Forests in the Kumaon hills.*

The effect of grazing combined with excessive lopping and felling in the hills has been already mentioned under question 19 (*d*). Of these harmful influences, grazing is probably the less important but is nevertheless aiding serious erosion in many forests.

Oral Evidence.

36,791. *The Chairman:* Mr. Channer, you are Chief Conservator of Forests in the United Provinces?—Yes.

36,792. We have your note of the evidence that you wish to put before the Royal Commission. Would you like to make any statement in amplification of that at this stage?—No; I do not think that I want to say anything new now.

36,793. Are you satisfied with the degree of touch between your own department and the Agricultural Department?—We have very little touch with the Agricultural Department proper; we do not come into contact with them. The great bulk of the United Provinces forests with which I am concerned affect the Province only a very little. They are all on one long belt where the population is scanty and the agriculture is of rather a precarious nature and we do not come up against the conditions of the Province as a whole.

36,794. I suppose that statement is really a relative one; in fact, a very considerable rural population cultivate on the edges of your forest land, do they not?—Yes, there is a considerable population, but it is very sparse compared to the really thickly populated parts of the Province, except in Gorakhpur.

36,795. Have you shifting cultivation in your forests?—We do not allow any shifting cultivation inside the forests. A good deal goes on outside on waste lands. There is an enormous area of waste land round about the forests which is used for shifting cultivation.

36,796. Have you distinct tribes whose tradition it is to live by *jhuming*?—I should not call that a real aboriginal custom, except that there is a small band of people called *Tharus* who live round about the Sarda river.

36,797. I see that, on the first page of your note of evidence, you express the view that the existing state of knowledge as to the damage that grazing is likely to do to both trees and grasses is really insufficient to enable you to dogmatise at this stage?—It is insufficient to dogmatise in detail on the varying intensities of grazing. We cannot say exactly that one acre is required for one head and so on.

36,798. I suppose the damage done to growing forest takes a long time to show itself; saplings are eaten off and come away from the root, and young trees are bent by cattle treading on them, and it is only in the course of years that it is possible to measure the damage done? Is that the position?—When we speak of damage by grazing we mean more the prevention of natural regeneration than damage to the growing trees which are quite above the reach of the cattle, and especially the trampling of the cattle makes the ground so hard that no seedlings will come up.

36,799. On page 329, in answer to our Question 19 (*b*), you say that the only step that is likely to place fuel from certain forests within the economic capacity of the population is chiefly reduction in railway freight rates?—I think that it would be a help, but I do not think that it would really go very far. The carriage of fuel by rail must always remain a very large factor. You cannot carry it for nothing; it is very bulky, and although one or two railways might bring down their charges a little, I do not think there is much in that.

36,800. You are not prepared to say that the existing rates on the whole are excessive?—No.

36,801. Are you making charcoal?—Yes, we are making renewed efforts to put charcoal on to distant markets, but we do not meet with much response from the markets and we find it very hard to sell it.

36,802. Is that because cowdung is preferred?—I do not think it has anything to do with cowdung. There is no hope of selling charcoal in villages; our fuel markets are entirely in the towns.

36,803. What is charcoal used for? Is it used for cooking purposes?—Yes, for domestic purposes, and in small factories where they keep small furnaces.

36,804. Have you any fodder reserved in your forests against the possibility of a fodder famine?—We have, in the western part of the Province, a small scheme for making fodder in stacks. The idea is to have a small reserve to begin on in case we should be asked to produce fodder on a large scale in a famine; it is also largely educational, so that our staff may be kept up-to-date. That is really the main benefit.

36,805. Do you keep the fodder preserved for two or three seasons?—Yes; the idea was to experiment with a view to seeing how long it could be kept. We have now kept some for five years and we find that it can still be eaten, although the fodder is very poor.

36,806. Is that in a thatched stack?—Yes, with careful re-thatching and repairing every year.

36,807. Can you give us any indication as to the amount of fodder stored at the moment?—I am afraid not.

36,808. Is it a considerable amount?—It is very small and of no importance really.

36,809. I have it in mind that a considerable experiment was attempted in this Province in the direction of growing fodder grass on certain waste

lands under the direction of your department; is that so?—I have no knowledge of it, I am afraid.

36,810. Your efforts have been directed with very considerable success towards the prevention of erosion of ravine heads and other land liable to be washed away, by means of encouraging the growth of trees on the land in question?—Yes; but we have trusted to nature to grow the grass.

36,811. Simply kept away the cattle?—We have closed the areas for the purposes of afforestation and the grass comes in itself.

36,812. Have you planted young trees?—We have both sown and planted them.

36,813. Do you fence?—Yes, we fence the areas immediately under regeneration till they are about four or five years old.

36,814. What type of fence do you use?—The three strand barbed wire, but we suffer very much from wild animals, especially porcupines, and recently we came to the conclusion that it would be well to have a better fence against these animals.

36,815. They bark the trees, do they not?—They eat the trees completely.

36,816. What about deer?—There is not much difficulty about deer.

36,817. And pig?—Yes, they do a good deal of damage.

36,818. Is there great scope for work of this sort in these Provinces?—Yes, there is a tremendous area to be done and it would afford a great deal of benefit. The area we tackle is minute compared to the total area of this kind of ravine land which is going on increasing at an almost visible pace.

36,819. It is a question of protecting the existing agricultural land? Is that the point?—Yes, we find considerable difficulties in protecting existing cultural land because when the ravines begin to come into the fields they cultivate right up to the edge of the ravine and they will not give us even a yard to plant round the edges of the ravines, and in such circumstances we can do nothing.

36,820. On what basis have you selected the areas where your work has been carried on?—We began with what is called the "Fisher" forest in Etawah where a certain Collector had done something of this sort himself. He created this forest with the idea of growing *babul* trees to supply Cawnpore factories; in fact he grew a very successful forest there which one of the Cawnpore firms took over and felled. We took over this forest from them and proceeded to extend the work.

36,821. Can you give the Commission any idea of the area protected by what you have done already?—We have actually afforested just over 14,000 acres of ravine land, and we are doing about 2,000 acres a year at present.

36,822. That is the actual area planted?—It is actual plantation.

36,823. Of course, the area protected by that is, I suppose, a good deal larger?—The area saved from getting any worse is larger.

36,824. In the processes of nature, the result of not having trees and grasses to prevent erosion is to carry these *nullahs* back into the country indefinitely?—Yes.

36,825. Do you suggest that there should be any attempt to compel villagers to leave the necessary minimum amount of land for planting to protect their lands against further erosion?—My experience is that compelling villagers to do anything at all is not promising.

36,826. If other forest land were available reasonably near the village, do you think an exchange might be effected, so that the cultivator would

get conveniently situated land, equal to the total area required by you for protective afforestation?—In the districts where we have been doing this kind of work, that has not been possible, because all the land that is at all suitable for cultivation is cultivated. Only uninviting tracts, where we could grow forests, are left uncultivated.

36,827. I understand you are considering the possibility of making experiments in *panchayat* control of forests?—Yes; a Deputy Collector of these Provinces has been sent down to Madras to study the methods there of forming communal forests. That was with a view to settling the difficulties in the Kumaon forest circle rather than in the plains.

36,828. Do you feel that the interests of the cultivators whose land is near the forests are receiving a fair share of consideration in respect of the wild animals having their habitat in the Government forests?—We do not do anything particular to get rid of wild animals.

36,829. Do you do anything to protect them?—We do not do anything to protect outlying fields.

36,830. What is the situation in the Government forests near cultivated land? Is unlimited shooting by those persons who have licences permitted? —No; they are not allowed to go into the forests and shoot under the shooting rules. Those who have guns are allowed to shoot anything that comes out on their fields.

36,831. Are persons who are allowed, under the shooting rules, to go into the forests, controlled in any way as to the size of the animals which they are allowed to shoot or the particular species?—The whole idea of the shooting rules is protection of game; that is what they are for. We ourselves suffer a great deal from the amount of deer in the forests. As regards keeping down the numbers, the shooting rules do not meet the case at all.

36,832. Do you think the shooting rules are justifiable?—From a commercial point of view, certainly not; it is entirely sentimental.

36,833. How long is it since these rules have been reviewed?—It is about twenty years now since the present rules came into force.

36,834. I see you have a booklet giving illustrations of ravine reafforestation?—There are pictures taken after reafforestation has been effected.

36,835. Can you give us any idea of the total expense of protecting ravine land?—Our cost in establishing a forest is Rs.80 an acre.

36,836. That is for forest area established?—Yes, actual trees.

36,837. Over how many years is that spent?—That has been for about the last twelve years.

36,838. That includes fencing?—That includes everything.

36,839. How soon would these areas be available for grazing?—Three to four years.

36,840. In three to four years from the time you start planting, it would be safe to allow grazing?—Yes.

36,841. What is the size of the trees in three or four years?—Anything from seven feet and over. Of course, they do not do as well everywhere, but they are mainly out of the reach of cattle.

36,842. What is the custom here? To leave them for two years in the nursery?—In these areas we have more direct sowing than anything else, but where we have nurseries it is one year only .

36,843. Does it work out very much more expensive than the nursery system?—Direct sowing is cheaper, but if we have to do a great deal of replacement it works out more expensive.

36,844. Have you attempted at all to correlate the amount of expenditure involved in reclaiming these areas with the agricultural value which you protect?—No.

36,845. From the angle of public revenue it is an important consideration, if you are considering the extension of the scheme on a large scale?—Yes. We have not worked out in figures all the agricultural revenue saved.

36,846. *The Raja of Parlakimedi:* Is the reservation of forests increasing? —It is not increasing, except that occasionally we take up new blocks for afforestation. They are mainly private owned, and we take up the new blocks at the request of the zamindars.

36,847. You take them up?—We take them up at their request; we pay them eight annas an acre, and we do the work.

36,848. Has there been any record to show that such protection results in an increase of rainfall?—No. The evidence about an increase of rainfall on account of forests is very uncertain, and I think it must be regarded as an unproved thing.

36,849. In some places, when there are reserves, it has increased the rainfall to some extent?—The expert evidence is entirely inconclusive. There have been most careful experiments in Europe and America, and it is not considered that they provide any evidence that it really increases the actual rainfall. It increases the amount of rainfall that goes into the ground enormously, and that is the chief benefit.

36,850. It prevents evaporation?—The rainfall, instead of rushing away, is retained in the soil.

36,851. What are your commercial trees and plants?—The *sal* tree is the main source of our revenue, and, to a certain extent, *deodar* in the hills. The *sal* is the tree of the United Provinces.

36,852. What is it chiefly used for?—For railway sleepers and constructional work of all kinds, rafters, beams, &c.

36,853. Is any rosin being taken out of it?—Not out of *sal;* rosin comes out of pine.

36,854. There is a variety similar to *sal* from which they extract rosin?— I really do not know. The *sal* does give a gum, but it has no commercial value.

36,855. Have you got any tanning bark producing trees?—The *sal* bark itself is fair tanning material. Cawnpore has made several efforts to use it, but they have always dropped it. They did not find that the amount of tanning material in the bark was worth the cost of the carriage; I think that is the trouble.

36,856. To meet the demand of the fuel difficulty in villages, in your reserves do you allow people to go into the forests to pick dead wood?—Yes. All surrounding villages have the right of picking up dead wood.

36,857. Have they to pay any fees at all?—It differs in different localities. In the majority of cases, the people living on the edge of the forests have free rights to fuel. In some divisions there are no such rights; they merely pay a very small fee for a permit.

36,858. Is not the quantity restricted?—No; we never attempt to measure it.

36,859. You say that you wish to have the co-operation of the villagers for raising plantations?—Yes.

36,860. To what extent do you wish to have that co-operation?—My idea is that if the villagers were themselves anxious to have village forests for fuel supply, if the technical department controlled the work, they should give the labour voluntarily, either free or at very small rates. In that way, the expense would be kept down, the labour difficulty would be overcome, and instead of having the whole thing objected to all the time, they would be enthusiastic supporters of it, and they would help to protect it.

36,861. Have you had any non-official body in this Province helping in protect the forests?—No.

36,862. Such as *panchayats*?—No. We have not tried any village forests of that type yet but, as I was saying just now, we are enquiring about the system in Madras.

36,863. In the Central Provinces, they have what are called forest villages to provide labour for some of their forest operations. Do you have that sort of system here?—We have two or three such villages, and we have created them where labour is very scanty.

36,864. What is the remuneration you pay to a villager of that type?—They are allowed to cultivate the land inside the reserved forest, and their remuneration is what they make out of growing crops.

36,865. What sort of work are they expected to do?—Repairing roads inside the forest, cutting fire lines. They have to do all the various forest work which we have to do.

36,866. Clearing the fire lines?—Yes.

36,867. When they cut those lines, are they given any portion of the wood that they have to clear from the land?—All these forest villages have everything they want. We treat them very liberally.

36,868. Is the work limited? Are there any prescribed hours of work, and so on?—Yes, the number of hours of labour is laid down in our agreements: so many men in the year have to be provided and so many days' work.

36,869. *Sir James MacKenna:* I am very much interested in your suggestion on page 330 of your note that the system of *taungya*, which in Burma we considered most objectionable, might profitably be utilised in the afforestation of your ravine lands. By being permitted to indulge in this shifting cultivation I suppose people would develop an interest in the tract?—We use it as a method of replacing the forest without cost; we clear-fell a part of the forest, put *taungya* cultivators on that area, and when it has grown again we put them on the next area.

36,870. They are kept well under control?—Yes; it is very limited in scope. It can only be done where there is an excess of cultivating population and a scarcity of land.

36,871. *Mr. Calvert:* Who takes out the roots and stumps?—They do.

Sir James MacKenna: It is a very interesting suggestion from the point of view of Burma.

36,872. *Professor Gangulee:* Have you facilities for carrying on research into forest products in the Province?—Yes, we have a research branch, and we depend a good deal on the central research branch at Dehra Dun.

36,873. You are closely connected with the central research branch?—Yes we keep in touch with them.

36,874. Where is your forest research station?—We have no research station; our officers go about all through the forest in the cold weather and the hot weather, and in the rains they go up to Naini Tal; we have offices there; we have no laboratories or anything of that sort.

36,875. Your investigations are then chiefly limited to observations of forest areas?—Yes, measuring the rate of growth of trees, observing the behaviour of forests when treated in different ways, and so on; experimental areas of all kinds are observed.

36,876. As you have no provincial laboratory, you cannot carry on any researches on, for instance, soil problems associated with forestry?—No, we have no means of analysing soils.

36,877. Nor have you facilities for the investigation of problems arising out of different forest areas?—That is done more by observation than by any actual tests of soil.

36,878. When you have a problem of that sort, you approach the central research station at Dehra Dun?—Yes.

36,879. For instance, problems with regard to forest insects?—Yes, we go to Dehra Dun entirely for entomology; we have no local entomologist.

36,880. You collect data and submit them to this central research institutin for investigation?—Yes, they deal with our insect investigations.

36,881. To what extent in this Province may *usar*, alkaline land, be afforested?—We are experimenting with regard to *usar* land now; we have been doing so for the last two or three years; I cannot say that we have had any direct success so far, but we have received a certain amount of encouragement.

36,882. There is a great deal of scope in that direction?—Yes.

36,883. It would be of great advantage if you could in some way counteract the effects of the alkaline deposits?—Yes.

36,884. Where are your subordinate officials trained?—At Dehra Dun down to the rank of ranger; below that we train them locally.

36,885. Have you a forest school?—We have a peripatetic training class which wanders through the jungles.

36,886. Your forest guards are trained in that way?—Yes; we call them foresters; they are the men over the forest guards, between them and the rangers.

36,887. The other officials are trained at Dehra Dun?—Yes.

36,888. Up to the Deputy Conservator of Forests?—No; the Assistant Conservators of Forests used all to be recruited in England, but now they are training Indians for the Indian Forest Service at Dehra Dun.

36,889. *Mr. Calvert*:- Are you getting much income from grass from these Etawah ravines?—Yes, a certain amount; I am afraid I cannot give the figure straight away, but we are able to sell all the grass we have got, and we consider that we could sell a great deal more; we have recently set up a hydraulic press for baling grass and exporting it to the larger centres.

36,890. Was this figure of Rs.80 an acre, which you gave the Chairman, representative of the gross expenditure, or was it net after deducting the income from grass?—No, that is net after deducting income.

36,891. Do you think you will be able to recover that from the sale of timber when it is ready for cutting?—Yes, we hope so. Of course, we are rather doubtful as to what these forests will be worth eventually; we have really nothing to go on.

36,892. It is not yet certain to what extent they will be an economic proposition?—No, I rather doubt it myself.

36,893. I have read these two reports on the work; has the subsequent course of events in any way led you to alter the opinions therein expressed?—We have had a lot of trouble lately with trees dying; we have had rather a set back; some of these larger forests of *babul* have suffered terribly from frosts lately, and also from the existence of a pan of *kankar* underneath.

36,894. In the total forest area under your charge, could you tell us the area that is excluded both from cutting and from grazing?—It is practically nil.

36,895. Practically all the grass in your forests is available for cattle?—Yes.

36,896. Do you anticipate valuable results from this Dehra Dun research work on utilisation?—I think they will be of more value to the commercial world than to us.

36,897. Is there any hope that they may lead to the establishment of industries subsidiary to forestry?—Yes. For instance, they have established the treated sleeper industry, and they have great hopes of establishing a paper industry and a match industry.

36,898. There is wood here which is suitable for matches?—I should not call it suitable; there is wood that will do.

36,899. It will serve the purpose?—Yes.

36,900. Have you any irrigated plantations in this Province for the supply of wood to towns?—No.

36,901. Are you attempting here to protect agricultural land which is subject to damage from annual floods?—We have made endeavours to check the damage done by the floods coming down from the Siwalik Hills by keeping the streams in their courses, but we have not met with much success; we can only erect small *bunds*, and they generally get washed away.

36,902. Is it true that you are exploiting your forests without regard to the agricultural interests?—I should have said not; I do not quite follow the question.

36,903. Do you think your Forest Department is apathetic concerning the interests of the agriculturists?—No, not at all.

36,904. Is it true that your department would not shrink from levying fees and enhancing them, however harmful it might be to agricultural interests?—No, it is not true.

36,905. Is it true that, owing to the number of wild animals in your forests, the number of men and women killed is sometimes tremendous?—No.

36,906. In your general forestry work, do you not do your best to show the utmost consideration to the legitimate interests of people in the neighbourhood?—Yes, we do our best always.

36,907. *Mr. Kamat*: On page 332 in your note you lay down a policy as to fixing grazing fees, and you say: "For example, assume that the market value of a herd of 100 head is Rs.10,000, the owner's net profit at 5 per cent. should be Rs.500; say his revenue is Rs.1,000 and his other expenses are Rs.100, then he can afford Rs.400 for forest grazing: Rs.4 per head." It seems to me that in this calculation his percentage of profit or his revenue is based on hypothetical figures?—Entirely.

36,908. If that is the case, would it be quite fair to fix a fee on purely hypothetical data?—I never intended that the fees should be fixed on such data; I merely put that in by way of explaining what I meant when I said that the grazing fee should be fixed on a commercial basis.

36,909. Yes, but the point is, how are you to get at the commercial basis? It should not be arrived at on hypothetical data?—No, I quite agree; that was merely explanatory of my point, not that I ever intended to calculate grazing fees in that particular way.

36,910. This particular example may be explanatory, but the principle on which you propose to arrive at your level of grazing fees is not correct, because all the while you are assuming what his profit is going to be and what his revenue is going to be, and on that you fix the level of your fees?—But no grazing fees have ever been fixed by such a method; they are all far below that limit. If that principle were followed, we should base it on collected data, not on hypothesis.

36,911. But is it a workable principle to assume that the profit is so much? Surely you must fix your fees on some other basis?—We might not be able to work it out in that way. We have just the same difficulty as to the price of timber, and we are getting over that difficulty generally by putting it up to auction.

36,912. There you get the data because there is competitive bidding?—Yes; we might do the same thing with regard to commercial grazing.

36,913. That means changing the principle?—Yes.

36,914. You would not then be adopting this arbitrary principle?—I never had any intention of fixing grazing fees on assumed figures that I really knew nothing about; these figures were really only by way of explanation of my idea.

36,915. *Mr. Pim:* Is the opposition to your operations diminishing?—Yes, distinctly diminishing.

36,916. Would you say that the advantages are becoming recognised by the villagers in the immediate neighbourhood?—Yes, I should, very much so; the Divisional Officer told me the other day that he had hopes of persuading some villages to enclose areas on their own account for the grass, and work them in rotation without any afforestation at all.

36,917. You suggest communal forests; do you think there are hopes of these being practicable in this area?—Yes, I should think more so there than anywhere else.

36,918. More so there than in the hills?—Yes.

36,919. *Sir Henry Lawrence:* You mention that the shooting rules are based on sentiment. Has the sentiment of preservation of life become sufficiently strong to become an instinct?—Both the English and the Indians are very keen on sport. I think that a very large body of public opinion would decry any proposal that all sport should become extinct in the interests of either agriculture or forests.

36,920. Do you consider that the various species of game would become extinct if free shooting were allowed in the forests?—They would not become extinct, but they would become very much scarcer.

36,921. The total area of ravine land is 100,000 acres?—I am afraid I have not got the figures here.

36,922. It is given in this report; out of that you are now dealing with 14,000 acres?—Yes.

36,923. *Sir Ganga Ram:* Besides *sal*, what timber have you got here?—A certain amount of *deodar* in Chakrata, near Dehra Dun.

36,924. Have you ever thought of starting a resin industry from *deodar*?—We have a large resin industry with a big factory near Bareli.

36,925. Do you supply sleepers to the railways in your Province?—We supply all the metre gauge lines.

36,926. Is not *sal* suited for broad gauge sleepers?—We have not got many forests which will supply timber for broad gauge sleepers.

36,927. What other industries are you attempting?—Matchmaking, papermaking.

36,928. Have you done any research in bamboo?—No; we have very little bamboo in the United Provinces.

36,929. From what do you propose to make paper pulp?—I had mentioned the industries which the Central Research Institute at Dehra Dun is taking up.

36,930. From the raw material of your Province?—It is not really from this Province; but they have made paper from the coarse grass.

36,931. Has no research been done on the raw produce of your forests for the purpose of paper pulp?—Yes, our grass has been tried.

36,932. Not bamboo?—No.

36,933. Bamboo was tried in Burma?—Yes.

36,934. Have you not got much bamboo in the Bareilly district?—No.

36,935. Have you any big falls in the upper ranges of rivers from which electricity can be generated?—Yes, I believe so; there was a hydro-electric survey.

36,936. Are there big falls from which a large amount of electricity can be generated just as we are going to do in the Punjab?—I do not know much about hydro-electric matters.

36,937. Are there any perennial falls here?—There must be some.

36,938. Do you freely supply seedlings to the public, to the zamindars and others, if they want to increase their plantations?—So far as we have been doing the entire work for them; we have not been supplying the seedlings.

36,939. Is there no demand from the people? For instance, do you grow walnuts at all?—We do not grow walnuts.

36,940. Do you allow people to grow potatoes as interculture on any of your freshly-planted land?—Large areas of forest were taken and potatoes were grown on them, but we have never voluntarily given up land for potato cultivation.

36,941. Is not interculture with potatoes possible in any of the forests?—Potato cultivation is destructive to all kinds of cultivation afterwards.

36,942. I mean inter-cultivation?—We have not tried it.

36,943. Have you any Crown lands which you could give for agricultural purposes on lease to people who pass out from the Agricultural College?—I should not like to say that none of the lands we hold are uncultivable; some are cultivable, but our policy is to retain land for forests. We have a very small area at present in the Province and the policy of the Government is not to diminish it.

36,944. *Sir Thomas Middleton:* You said just now that potato cultivation was very destructive in forest areas; is that because of the soil erosion which takes place?—Yes; many of the hill sides in Kumaon become eroded entirely owing to potato cultivation.

36,945. Would it be possible to cultivate potatoes safely if the lands were carefully terraced?—Yes; but it would not pay, I understand.

36,946. Is there no terracing in the district?—There is for certain crops, but not for potatoes because the land is fit for potatoes for a year or two only and it would not pay them to terrace.

36,947. Are manures used in potato cultivation?—No.

36,948. Cultivators depend, I suppose, on the ash which they get when they burn down the forest?—Forest land produces excellent results for a year or two and then it is left fallow.

36,949. Because there is nothing more to burn?—Not because of the burning; but it seems to be incapable of producing anything further.

36,950. The excellence of the crop in the first instance is due to the burning of the forest brushwood?—It is due to the accumulated rot of forest produce for centuries; we call it humus.

36,951. You mentioned Rs.80 per acre as being the average cost of afforestation. How long is your ordinary rotation under such circumstances?—We expect the *babul* rotation, the principal tree we have grown, to be about forty years.

36,952. Do you reckon compound interest on your original cost?—No.

36,953. The question of interest does not trouble you?—That includes simple interest at 4 per cent., not compound interest.

36,954. You refer to areas in Garhwal and Naini Tal districts where it is not only impossible to obtain satisfactory natural regeneration and where the villagers get no real benefit from the forests because of the excessive grazing?—Yes; it is not only in Kumaon but everywhere.

36,955. The reference was to Naini Tal and Garhwal districts on page 8 of your note. You go on to say that closure creates fierce local resentment?—Yes.

36,956. You point out that the only way of meeting the difficulty is by educating the villager to the damage that he is doing himself?—Yes.

36,957. Has any attempt ever been made to provide that education either by the Forest Department or by the Agricultural Department?—A great deal has been done by individual Forest Officers constantly talking to villagers; we have had no organised campaign of village lectures.

36,958. What is the area affected in these districts?—About 4,000 square miles.

36,959. Would it be possible for the Forest Department to enclose an area of 1,000 or 2,000 acres and show what could be done by grazing a suitable number of cattle on that area, so that your Forest Officers might talk in villages with some experience behind them?—We have done that; we have many enclosed plantations in Kumaon where they see the results of enclosures. They appreciate very much what we have done in those areas.

36,960. I am trying to ascertain the possibility of converting your estimate of the value to be got out of forest grazing from a hypothetical figure into a real one. If you could show that there were profits to be made on 1,000 or 2,000 acres when enclosed and properly grazed, there might be some chance of convincing the villager?—What they want is food for their cattle; there are too many cattle.

36,961. Would it not be possible by demonstration to show that by keeping a smaller number of cattle they would be better off than with over stocked grazing?—I think the only solution is to get them to control the breeding entirely.

36,962. I think that the policy of the Forest Department for very many years has been cheap grass and dear grazing?—I should think our grazing is very cheap.

36,963. We were told in another Province that, at a conference of Forestry Officers in 1913, it was laid down that the proper policy to pursue would be a policy of making the grass cheap but the grazing dear?—Yes; but I am afraid we have never followed it.

36,964. We asked whether in that particular Province the policy was followed and we were told no, and I suppose the same is the case in the United Provinces?—Yes; the opposition is too great.

36,965. So that although Forest Officers know what ought to be done they are making no progress towards the accomplishment of their object?—That is so.

36,966. *Raja Sir Rampal Singh*: On the first page of your note, you say the rules affecting grazing are scrutinised every ten years?—Yes.

36,967. By whom are they scrutinised, by departmental officers or by Government?—By both. When a working plan is revised the special officer in charge of the working plan goes into all the questions involved, including grazing, and makes proposals which he considers will meet the needs of the villagers and the necessities of the forest as far as possible. That is referred to the Collector of the district and the Commissioner for their approval, and the objections of villagers and landholders are heard and an inquiry made into the whole matter.

36,968. Are non-officials consulted also?—There is no regular system of committees for consulting them, or anything of that kind, but the local non-official people are always consulted.

36,969. Only when they make objections?—Yes.

36,970. They are not consulted when the rules are framed?—That would rest with the Collector. If the Collector thought there was someone whose advice was worth having, he would probably consult him.

36,971. These rules depend on the sanction of the Commissioner and the Collector?—Yes; no grazing rules ever go up to Government without the approval of the district authorities. It is not, however, the rules that are revised every ten years; it is the area in the forest open to grazing which is revised.

36,972. On the second page you observe that villagers who get their fuel free sell their cowdung to other villagers. Is that due to ignorance on their part?—Partly. At the place where I found them doing that, however, I was told they were cultivators who had no rights whatever in the land, and who therefore cared nothing for its improvement. They practise a good deal of shifting cultivation, so that the value of manuring the land does not appeal to them at all.

36,973. Do you grow *babul* trees on this ravine land you are planting?—We grow them a good deal, yes.

36,974. You told us you had nurseries from which trees were transplanted. Do you have nurseries for *babul* trees also?—With *babul* we use chiefly the method of direct sowing, but we have grown them in nurseries also. We experiment with nurseries for all trees, to see whether the system pays us better than direct sowing.

36,975. What other trees do you grow?—We grow a tree called *siris*, and *khair*, a kind of acacia from which a dye is made, and *shisham*.

36,976. What grazing fees do you charge, on the average, per head of cattle?—The general average is Rs. 1.8.0 for a buffalo and 12 annas for a cow, per year.

36,977. What is the *taungya* system you mention?—The villagers are allowed to cultivate a forest from which the trees have been cut down, and are under contract to sow lines of trees in between their lines of crops. The lines of trees are generally about ten feet apart. They plough up the land, put in the trees and sow their crops in between the lines of trees. They are allowed to go on cultivating the same land for about five years, until the trees are well up, and they have to replace any failures in the following years, protect the trees from wild animals, and do the weeding, which is an essential part of forest plantation work.

36,978. Has this system been tried by your Department?—Yes. It has been very successful in the Gorakhpur district. It depends on having a large population and a small area of land available.

36,979. You hope for a reduction in the number of cattle by more attention to breeding?—Yes.

36,980. Has any attempt been made in that direction?—My point, of course, is the control rather than the improvement of breeding. Improvement will, of course, result as a natural consequence, but if the herds, instead of being allowed to wander all over the country just as they choose, were controlled, these enormous herds, which are of no value to anyone, would not exist.

36,981. The effect of that would be to decrease the number of cattle?—Yes.

36,982. So that the price of cattle would rise?—So many of these cattle are undersized, underfed and of no value for any purpose whatever. The

people do not even attempt to get any milk from many of them; some of them only give a pint a day, which is not worth the trouble of collecting.

36,983. Cannot their calves be sold?—There is a certain trade in calves, which are sent down country, and a good many of the animals are used for haulage, but the same amount of work could be accomplished with a smaller number of better animals. The life of an animal put into cart work is very short at the present time.

36,984. Has not the price of bullocks risen during the last ten years?—The price of everything has risen in the last ten years.

36,985. Yes, but our cultivators find great difficulty nowadays in getting bullocks at a price they can afford to pay. If the number were decreased I am afraid the price would become even higher than at present?—Possibly, but I think the advantage of having a smaller number of good cattle rather than a vast number of useless animals would make itself felt.

36,986. *Sir Ganga Ram*: Have you any light railways for transport purposes in forest areas?—Yes, two.

36,987. What gauge are they?—Two feet.

36,988. Do you use steam locomotives on that gauge?—Yes.

36,989. Is your hydraulic press for baling grass?—Yes.

36,990. What type is it?—Jessop's.

36,991. Then its capacity is not very great. Have you carried out any research into the growing of fruit trees or similar trees of commercial value?—No. We do not go outside our proper functions as a rule.

36,992. There is a tremendous demand in the commercial world for lemon oil, for instance?—Yes. There are, of course, many oils which have great commercial value.

36,993. Are there many roads in your areas devoid of bridges?—No. We have many unmetalled roads, and some of the District Board roads are very bad, particularly in forest areas, but they generally have bridges.

36,994. It is only the condition of the road that is bad?—Yes.

(The witness withdrew.)

PUNDIT GOVIND BALLABH PANT, Naini Tal.

Replies to Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—The efficiency of the agriculturist and his capacity to benefit by any special training in agriculture are determined by the general level of his culture and equipment. Considering the low percentage of literates in the Province and the very small number of boys who read up to the upper primary stage, it is, obviously, only a very small proportion of the agricultural population which can avail itself of any opportunity for a special training in agriculture. In order to remove this drawback, it is necessary to adopt a vigorous policy of mass education and to give it a distinct agricultural bias from the very outset. To take the questions serially:—

(i) The supply is insufficient.

(ii) There is an urgent need for extension of teaching facilities in many districts as there is only one vocational school at Bulandshahr in addition to the higher grade college at Cawnpore. In particular, there is urgent need for such an institution in Kumaon which, owing

to its peculiar physical characteristics calls for special treatment. Kumaon consists of the hilly districts with the submontane zone known as Terai and Bhabar and is clearly distinguishable from the rest of the Province. The nature of the country, the land tenure as well as the methods of cultivation, differ from those in vogue in the lower Province. No investigation has, I believe, been made so far into the agricultural problems of Kumaon, and it should not be deferred any further.

(iii) Yes, so far as possible.

(iv) Yes.

(v) Mostly, the hope of getting employment in Government service.

(vi) As most of the population is agricultural, the pupils are probably drawn from them, but people take to agricultural education not because of any special taste for it, but mainly with a view to securing some job. So long as the Bulandshahr school had not been started, the Cawnpore College was the only institution, and it was meant for the training of prospective *kanungos*, &c., and not for preparing agriculturists for their natural vocation.

(viii) Nature study should form part of the curriculum in primary schools, school plots should be attached to middle schools, and school farms to normal schools for giving instruction in agriculture as suggested hereafter.

(ix) The majority of students used to find employment in Government service.

(x) The department should investigate local conditions, should publish the results, clearly stating the type of agricultural activity which will suit different localities, the amount of money and material that will be needed to work it and the profits that it will yield. The department should help the middle-class qualified youth desirous of starting an agricultural career with part of the required capital, which should be recovered in easy instalments. If he wants to settle on Government land, Government should grant him sufficient land for the purpose on reasonable terms. It is necessary to give every possible encouragement to educated and trained young men to settle in rural areas, with a view to developing agriculture on improved lines. The Government will be relieved, to a certain extent, if farming and other agricultural pursuits are undertaken by private individuals on their own account, as in such localities the department need not run any farms at its own cost. It is also desirable to attract young men to this profession to check the growth of unemployment among the educated middle classes. In every case it should be easy for the Government to render pecuniary assistance to those young men who own land and are prepared to hypothecate it for the repayment of any capital advanced to them. There should be no difficulty in the way of Government advancing seed and implements and offering sound technical advice to such youths, if they start farms of their own. A large number of young men can be accommodated in the Government estates if the Government can protect them against the deleterious effects of a malarial climate.

(xi) No arrangements exist at present, but probably the department can arrange for some special short courses at big farms.

(xii) Higher agricultural education should be imparted at the Agricultural College, Cawnpore. The number of vocational schools of the Bulandshahr type should be increased and established in different parts of the Province, with due regard to the physical characteristics and the crops raised in different areas. Agricultural classes should be opened in normal schools, and agriculture should be one of the subjects prescribed for the vernacular middle examination. The Cawn-

pore College should be affiliated to the University of Agra, and there should be a Faculty of Agriculture in that University. The agricultural schools should be under the Department of Agriculture and agricultural instruction in vernacular schools should form part of the curriculum of those schools under the Department of Public Instruction. The Local Government should finance all those institutions. There should be an Agricultural Development Board in which the non-official members of the Legislative Council, the Faculties of Agriculture of the different Universities in this Province, the Boards of High School and Intermediate Education, Industries and the Departments of Agriculture and Public Instruction should be represented. This Board will serve as a central co-ordinating body, and will look after the promotion of agriculture in the Province, and will advise the Minister of Agriculture in matters pertaining to agriculture. Schemes of agricultural development should be placed before this Board before they are recommended to the Finance Committee. The Board should form small committees for different physical and agricultural blocks of the Province, the present circles being adopted for the present with Kumaon as a separate circle. There should be at least one school in each circle.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—Actual demonstration, at demonstration farms, of simple processes which are within the reach of an average cultivator impresses the cultivator more than anything else. Such farms should be established in the midst of a group of five or ten villages. The farms need not be very large, but will require careful management. The cultivator should be taken into the demonstrators' confidence and the details of the process adopted should be explained at every stage, at least to the holders of the neighbouring fields. The department may hire a field from a cultivator and the cultivator may himself be persuaded to run it on the lines demonstrated. A seed store should be attached to the farm, and, if possible, the department should also stock some implements which it should be prepared to give out on hire or to sell on the instalment system to cultivators for their own use.

Agricultural experts should be inspired by a genuine spirit of service, should have an understanding of, and sympathy with, the unsophisticated Indian cultivator who, even though illiterate, is thoroughly versed in his vocation and knows everything concerning his business. It is mostly on account of want of capital and information that he is still sticking to old methods. The method of protecting crops against insects and pests should be clearly explained to him while being practically demonstrated at the farm. If the experts make it a point to move freely in his midst, try to understand his difficulties, sympathise with him and thus win his confidence, and if means can be found to finance him, he can easily be persuaded to adopt modern methods. Vernacular and familiar terms for measures, &c., should be adopted in place of English terms.

A few instances of failure can be mentioned. Demonstrations at exhibitions and the working of the *Hadi* process of sugar manufacture were shown at various places, but they seldom won the confidence of the farmer. The tube-well system has cost a lot but cannot be said to have succeeded, mainly because of its prohibitive cost and the delay and defects involved in installing it.

QUESTION 4.—ADMINISTRATION.—(*a*) Every endeavour should be made to make the Provinces self-contained in the matter of expert knowledge and skill. Agriculture being a Transferred Subject, and being so largely dependent on local conditions, can best be handled by experts in the different Provinces under their respective Governments. The Government of India should assist the Provinces financially instead of increasing their

own scientific staff. The Agricultural Department of the Government of India can always advise Local Governments so as to avoid unnecessary overlapping and waste by occasional conferences of provincial Ministers and Directors.

(*b*) There should be adequate scientific staff for the necessary work of the Local Governments, and the Government of India may render financial assistance to them, which it should do at least so long as it does not completely remit the provincial contribution fixed under the Meston award.

(*c*) A thoroughly satisfactory state of affairs can only be secured by completely Indianising the services. A foreigner not only cannot reach the root causes of agricultural problems, a great many of which are, in India, interconnected with social usages, but, further, a great loss is occasioned through all his valuable experience being lost with the officer on his retirement. At present, an important part of the United Provinces, viz., Kumaon, which is full of potentialities, has been practically deprived of the State activities for agricultural development, whether research, investigation, demonstration, propaganda or teaching. As Kumaon consists mostly of hill districts, where transport difficulties form a serious obstacle to the import of food grains and provisions from outside, it is important that every effort should be made to make the division produce sufficient ordinary foodstuffs to meet its demands. Agricultural development cannot be achieved except through a network of easy communications. It is necessary to improve and extend the roads in Kumaon as, in their absence, neither agricultural implements nor good varieties of seed can be carried to villages, nor can agricultural produce be carried to the markets. Cattle breeding, dairying, fruit culture and preservation, should be developed. The possibilities of vine culture which has been admirably successful in the Swiss mountains may be investigated for the raisin industry, &c. Potato forms an important crop in Kumaon and, as the harvest alternates with the plains crop, it exports large quantities to the plains. The cultivation of the crop should be developed. The higher altitudes are specially congenial to sheep breeding for wool. There is a certain amount of sheep breeding practised at present in the Kumaon division, but the methods followed are not up to date, with the result that wool of an inferior type is produced. This wool is supplied to factories in the Province which manufacture woollen cloth. Improvement is urgently called for in the quality of this wool. There are numerous hill streams which can be utilised, if properly harnessed for cottage industry and irrigation and steps should be taken to utilise their hydraulic power.

QUESTION 5.—FINANCE.—Unless some methods are devised to render financial assistance to the cultivator, he cannot make use of any technical or improved methods of agriculture. At this stage, there is little hope of private bodies working on a co-operative basis for this purpose. At least, as an experimental measure, the system of supplying agricultural implements to cultivators on an instalment system should be tried. The present method of advancing seed on loan should be extended. *Taccavi* advances should be realised in easy instalments, and advances should not be made in cash through tahsil subordinates, but by means of cheques on some bank or treasury. The present system is very rigid and sometimes oppressive. The Government should have a primary charge on the crop for the seed advanced and on the implements and live-stock for the tools and plants supplied by them, and legislation should be resorted to to effect this if necessary.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) The agriculturist is deeply indebted. The average size of a holding is not adequate, and its produce is not usually sufficient for his needs. The rate of interest which he has to pay is very heavy, and it varies inversely with his resources. The

agriculturist lives a hand-to-mouth life and has to face occasionally the stress of bad weather and poor harvests, and is also required to make provision for marriages and other social functions. Once in debt, it becomes impossible for him to get out of it. He ordinarily borrows money from the village moneylender or zamindar. He is often obliged to take a loan from the dealer, to be repaid by his crop at harvest time when prices are very low. The amount goes on augmenting at a high rate of compound interest; so the debt is never completely liquidated.

(*b*) I feel that the agriculturist cannot be saved and set on the road to redemption or advancement until he is relieved from the village moneylender. No bank can advance money to him on a reasonable rate of interest, nor can the system of co-operative credit be applied successfully so long as his debts are not cleared, which no society at the outset can afford to do. I strongly recommend that the Government should liquidate the debt and recover it with interest at, say, 8 per cent. by means of easy instalments in case of solvent agriculturists. It should be the first charge on the crops, implements and holdings, and if any tenant is in default as regards payment, it should be open to the Collector to confiscate his holding and to settle it on another agriculturist, without prejudicing the rights of the landholder. It should not be difficult for the Government to raise a development loan for such a purpose at 4½ to 6 per cent. So, if proper care is taken, there should be little risk involved in such an arrangement. The cultivator, after he has been once redeemed in this manner, should not be allowed to raise any further loan except for real necessity. If such a suggestion is adopted, it will be necessary to take special measures by means of legislation. All details will have to be worked out. It will be wholesome to restrict the credit of cultivators, but it will not be equitable to do so so long as his previous liabilities are outstanding. The extent of agricultural indebtedness is very great, and the suggestion that I am making is not very easy or simple; but I am convinced that unless some bold step is taken in this direction, we cannot begin the constructive process. I would urge that it should be tried, at least in selected areas.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—In the present state of agricultural poverty and lack of other avenues for employment, it is difficult to prevent fragmentation. Legislation can prohibit the sub-division of a holding through the courts where it reduces the size below a certain minimum, but no law can prevent co-sharers in a holding from sub-dividing it by mutual consent. The law of inheritance is too deep-rooted to admit of any tampering in any form.

(*b*) Some little fragmentation of the holding is unavoidable on account of the different kinds of soil and the allocation of different blocks to different crops, but there is still enough of room for consolidation. Protracted inquiries by responsible officers have led them to the conclusion that at the present stage no compulsion can be helpful. Persuasion and propaganda are, therefore, the only available means for securing this purpose.

QUESTION 8.—IRRIGATION.—No efforts have been made for the extension of irrigation channels from the perennial streams in Kumaon. The surface of the mountains being naturally steep, even a short break in the rains produces disastrous results. The system of irrigation should be adopted by means of channels from the running streams.

QUESTION 9.—SOILS.—In view of the extensive canal projects in the United Provinces it will be worth while to investigate the causes of the formation of alkali soils, which will enable us to guard against serious damage.

QUESTION 10.—FERTILISERS.—Considerable impoverishment of land must occur due to increased pressure of crops; and as a consequence of the

tremendous exports of grain crops which are continuously removing large quantities of fertilizing ingredients from the soil, never to be returned into it. In addition, export of large quantities of oil seeds and cakes leads to serious depletion of fertility, not only by direct loss due to their non-use as manure, but still more by deterioration of live stock. The question of difficulties attendant on the export of liquid oil must not be allowed to stand in the way of progress. Another argument, that restriction in the export of oil cakes will affect the direct income of the cultivator, cannot also hold, because the increased fertility of his land due to manuring and improvement in his live stock will more than compensate for this. Then again the export of bones is causing irreparable loss to the country, and should forthwith be stopped.

(*b*) In the neighbourhood of forests ample fuel should be provided to the cultivators, and in other places arrangement should be made for planting groves for the supply of more fuel.

QUESTION 11.—CROPS.—(*a*) (iv). Wild animals cause considerable damage to crops, especially on the outskirts of the forests. The method of protecting crops by means of masonry walls erected on the borders has proved successful in certain parts of Terai and Bhabar estates. The system should be extended, and where masonry walls cannot be had wire fencing should be set up. Some experiments were recently made by some zamindars of Kashipur, and they proved quite effective. Licences for fire arms should be given freely to villagers living in villages near forests. Considerable damage is done to the crops by wild beasts in Kumaon, and even some persons are killed annually by them; in some cases one single tiger or leopard is known to have killed a considerable number of human beings. Arms licences should not be refused to those who want them, and not only muzzle-loading but also breech-loading gun licences should be freely sanctioned. Besides, there should be no restriction in the matter of shooting wild beasts by arms licence holders.

QUESTION 14.—IMPLEMENTS.—Improved implements of simple types have good scope, but the use of extensive labour-saving machinery will be only limited owing to human labour being easily available. Implements should, however, be within the means of the cultivator; costly or complicated machines are not suitable.

(*b*) Convincing demonstrations in the economy and use of the implements and financial assistance are essential. Implements may be supplied to cultivators on the instalment system or on hire. There are practical difficulties in replacing the indigenous implements wholesale. Mechanics cannot be found in villages to repair them, parts cannot be obtained in the rural areas, holdings are not compact and the cattle are not strong enough to work heavy implements. Indigenous implements have stood the test of time and, so far as possible, they should be improved, as very few people will be able to make use of costly or novel substitutes. Substantial encouragement should be given to Indians for investment in manufacturing enterprises, and effective steps should be taken to turn out well-trained agricultural engineers.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) About nine months in the year; in the slack season he has nothing to do, all industrial avenues being blocked.

(*b*) Demonstration and propaganda and facilities for technical training and marketing of commodities. Handspinning and handweaving can be universally introduced. These do not require any great training or skill, and do not call for costly tools. They will not be an innovation but will be things familiar to the countryside, and people can take to them with alacrity. Raw material for spinning can be had everywhere. It is difficult to

imagine a simpler and more suitable form of industry capable of universal introduction which can usefully employ a man or a woman whether old or young, strong or infirm, in his or her idle hours. Subsidiary agricultural industries that can be adopted in Kumaon with Government aid are bee culture, sericulture, basket work, fruit preserving, making raisins, &c., from grapes, working up hemp and other fibre materials, spinning and weaving of wool.

(*c*) Lack of capital, of technical knowledge of the economics of production, transport and marketing difficulties, and restrictions imposed by the Forest Department.

(*d*) Yes, as long as the people are not sufficiently aroused to stimulate private initiative.

(*e*) Undoubtedly. The German beet sugar industry owes its success chiefly to agricultural workers finding employment in factories during the idle period.

QUESTION 18.—AGRICULTURAL LABOUR.—There is a shortage of agricultural labour in the Terai and Bhabar Government estates. Labourers are generally offered a large advance by the cultivators to tempt them to settle there. In order to prevent them from leaving the village, agreements were obtained from them in writing and action under the Workmen's Breach of Contract Act was taken, in some cases every year, to fetch back the absconding labourers. This Act has been abolished by the Legislative Assembly and the cultivators are as a body upset on this account. It indicates that, left to themselves, the labourers would perhaps not like to stay there.

As I have stated elsewhere, there are extensive tracts of cultivable land in the estates which are lying waste. The main difficulty is the climate; it is very unhealthy. If effective measures were taken to remove the malarial drawback by a suitable system of drainage and pure water supply, and sanitary residential buildings were provided, it would go a long way to mitigate the present difficulty. If zamindari rights are conferred on the farmers who settle there, it would serve as an irresistible attraction. Measures for the improvement of the health conditions of the tract, along with a liberal system of land tenure, will facilitate the development of this area.

QUESTION 19.—FORESTS.—Forest lands are ordinarily worked in the manner best suited to their exploitation by the Forest Department and not out of regard for agricultural progress or interests. In Kumaon there has been constant friction between the agricultural population and the Forest Department owing to the apathy of the Forest management towards the agriculturist. So far the Forest Department has cut away and sold large natural forests and have planted comparatively very few. In reserved areas the facilities for grazing given to villagers are not adequate. As the department ordinarily does not limit the number that can graze on paying fees and strictly restricts the rights of the villagers, it appears that the number of villagers' cattle is not limited because the forest cannot stand any further grazing. The department would not shrink from levying fees or enhancing them, if such action added to its income, however harmful it might be to larger agricultural interests. It does not hesitate to dispose of forest produce needed for agricultural purposes to traders who export it in large quantities from the neighbourhood of villages to distant places. This materially hampers the villagers in their every day work for a considerable time.

The rules of the Forest Department are very rigid and the lot of the villagers living in the neighbourhood of forests is often unenviable. In some cases boundary pillars of reserved forests stand on the edges of cultivated fields, leaving no room for extension of cultivation. If cattle stray into the forest they are sent to the pound though there be no fence or wall separating the forest from the village land.

Agricultural lands are also included in the forests sometimes and even when they are of little use to the Forest Department they are not restored to the agriculturist if once the department has got hold of them. The policy of rigid reservation of forests in the midst of disarmed people is fraught with serious danger as it leads to the destruction of crops and cattle and even human life, sometimes the number of men and women killed being tremendous. Rural economy should not be disturbed so far as possible and the needs and requirements of the agricultural people in the neighbourhood should receive primary consideration in the matter of forest management in every legitimate manner, and it should not be costly. Lands which are not fit for agriculture but can be used for afforestation can be profitably utilised for this purpose.

QUESTION 20.—MARKETING.—The agriculturist seldom takes his farm produce direct to the market. It is ordinarily his practice to borrow money for seed and for his maintenance while the crop is growing. As soon as the crop is ready, his banker gets hold of almost the entire stock, which he values at a substantial discount, and after meeting the immediate demand on account of rent and water rate, etc., he sets it off against the outstanding amount, charging interest at about 25 per cent. per annum, and strikes the balance which goes on accumulating and expanding during the next six months. By far the vast majority of cultivators are victims of this process by which the entire stock is absorbed on the threshing floor. He cannot be assisted or relieved materially by means of elaborate bulletins. Some remedy should be found for his indebtedness and the Government should take up the question of liquidating his debts or offering security therefor to his creditor. This is the most stupendous obstacle to agricultural progress, including free movement of agricultural produce to the best market.

(*d*) Marketing of agricultural products should be organised on co-operative lines and such information should be made available to the agriculturist through associations, though this can be introduced in very few localities for some time to come.

QUESTION 22.—CO-OPERATION.—The Report of the Committee on Co-operation published last year deals with this subject exhaustively.

Apart from the moral and material drawbacks to the growth of the co-operative system on normal lines on account of poverty, ignorance and lack of the spirit of self-help fostered by a bureaucratic Government, the indebtedness of the tenants is a serious obstacle. Co-operative societies cannot prosper when the members are indebted to other creditors. While experiments may be made in all directions wherever feasible, the department should concentrate on rural credit societies. Legislation in the cases mentioned in sub-section (*c*) seems desirable.

QUESTION 23.—GENERAL EDUCATION.—The existing system of education is too literary and theoretic. It is not related to the environment in which the students grow. It does not take account of the needs of the classes who attend school. It creates a sort of aversion for manual labour and does not develop the spirit of courage, enterprise, initiative or constructive effort, in as large a measure as is necessary.

The agriculturist should be kept in touch with his vocation by practical operations at every stage of rural education, as I have suggested in the beginning. Compulsory education has not been introduced in any rural area in this province so far. Apart altogether from those who are handicapped by lack of facilities for education, the boy who gets through the primary class is not palpably and demonstratively more efficient and productive than one who gives up school earlier or does not care to join it at all. The system naturally does not rouse any enthusiasm among the masses steeped in colossal poverty. If the system of education is purged of its foreign element and if it is shaped so as to develop a bias towards national requirements, the difficulty will be overcome to some extent.

Pundit Govind Ballabh Pant.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) Propaganda, demonstration and extension of facilities for adopting agriculture as a vocation.

(*b*) Lack of means and want of enterprise and knowledge.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) The supply of pure drinking water should be attended to. People are too poor or too apathetic to insist on pure water. In the hill parts of Kumaon, drinking water is frequently contaminated at its source. A pure water supply will considerably improve health in rural parts. Lantern shows, child welfare and maternity schemes, the giving of facilities to educated people, and the grant of subsidies to qualified medical practitioners to induce them to settle in rural areas, lectures on hygiene, temperance, &c., and circulating libraries, are some of the measures which can be introduced to improve the lot of the rural population. The Government should also endeavour to build up model villages in suitable centres.

(*b*) Economic surveys should be conducted by Government through combined official and non-official agency. They should comprise an inquiry into the economic factors, such as the total wealth of the village, annual income, the standard of living, the amount of debt, the condition of livestock and implements, the nature of the land tenure, professions followed, crops raised, revenue, rent and produce per acre in different classes of soil, extent of irrigated land, average longevity, vital matters regarding infant mortality, birth and death rates, &c., age and cost of marriage, &c., number and ages of widows and orphans and their means of living, literacy and facilities for education, use of manures and fertilisers, injury by wild beasts, rates of interest, nature and value of buildings, rural sports, games and festivals, subsidiary industries, vital statistics regarding cattle, veterinary arrangements, marketing of agricultural produce, facilities and condition of communications, sources of water supply and their condition, stocking of manure and system of drainage, immigration and emigration, means of irrigation whether by canals, tube wells and masonry or *katcha* wells, home-made and foreign cloth used in the village, persons working abroad, money received from work done in other places, number of zamindars, tenants, labourers and extent of holding of each class, zamindars residing in the village and their qualifications, pursuits and pastimes, exports and imports, proportion of males and females, adults and children to population, proximity and effects of forests, &c.

QUESTION 26.—STATISTICS.—The Government of India should organise a department of statistical audit, the main function of which will be the examination of the information collected by Local Governments. The department should be under the Legislature and independent of the executive Government. In every case, special pains should be taken by responsible officers to test the veracity of the statistics collected by local officers.

Oral Evidence.

36,995. *The Chairman*: Pandit Govind Ballabh Pant, you have been good enough to provide the Commission with a note of the evidence that you wish to place before us. Would you like to supplement that by any statement at this stage?—I have no specific suggestions to make except one that was brought to my notice only yesterday by some of my friends who have asked me to tell the Commission that the customs duty on wire fencing which is used for the protection of crops against wild beasts is 15 per cent., while that on the wire itself is 5 per cent. I am not prepared to vouch for the accuracy of these figures not having been able to check them myself, but if that is so, I think that it is a matter which might be taken into consideration. There is also another point which was reported to me though I have not myself seen the report. I was told that certain

statements had been made by some witnesses, at least by one witness, questioning the competence of the District Boards to deal with primary education.

36,996. We might have a discussion about that later. Would you first tell the Commission what district you come from?—Nainital.

36,997. And have you, yourself, farming experience?—I have never been a practical agriculturist, but we have small holdings of our own and I have been in touch with them.

36,998. You have been brought up amidst rural surroundings?—Yes.

36,999. You point out on the first page of your note of evidence, in answer to Question 2 (2), that it is your view that there is an urgent need for the extension of teaching facilities in many districts, and then you say there is only one vocational school at Bulandshahr in addition to the higher grade college at Cawnpore? Are you familiar with the school at Bulandshahr?—I have heard of it and have studied the question in my public capacity, but I have not been to the school myself.

37,000. At what stage in a boy's career do you suggest that he should go to such a school as Bulandshahr?—I think, as soon as a boy completes his primary stage, if he is given a training for about three years in a vocational school that would be quite good.

37,001. That would take him up to about 12 in the case of the average boy?—It would take him to about 15 years.

37,002. Before he leaves the primary school?—No.

37,003. He would go at 12 and leave at 15?—Yes.

37,004. Are you aware of the age at which most boys go to Bulandshahr?—I do not know the age exactly but I fancy that there are two classes of students in the Bulandshahr school, teachers who are already in the profession and who are educated to receive training there so that they may train boys in the agricultural methods in primary or middle schools. For that of course there is no age limit; and the others, I presume, are ordinarily between the ages of 15 and 18.

37,005. Your idea is to extend a type of education which would give a vocational flavour to the curriculum when a boy was about 15 years, or from about 13 to 15 years of age?—Yes; they would not be agricultural experts, but they would be good farmers.

37,006. Are you a member of the District Board?—Yes.

37,007. Have you had long experience of District Board work?—Yes, I have been a member for about eight years, I think.

37,008. In your view is the District Board, as at present constituted, a satisfactory body for dealing with educational problems in the district?—The District Board has got expert advisers such as Deputy Inspectors to look after the schools and, as far as arousing an interest in education or spreading it goes, there is no better machinery available. Nothing is perfect.

37,009. The position is that since the Reforms you have an unpaid Chairman, and one Secretary who does the general secretarial work?—Yes.

37,010. Do you think it would be an advantage if you had a sub-committee to the District Board with an Educational Secretary at the service of that sub-committee?—The District Boards have got the power to form educational sub-committees and ordinarily they do.

37,011. Does your Board do so?—Yes.

37,012. And is there any secretarial assistance available?—We had the Deputy-Inspector of Schools as the Secretary of that committee, I myself being the Chairman for some years.

37,013. Do you find that works satisfactorily?—When the Government does not issue illogical rules, these sub-committees can work very well.

37,014. Have you any suggestions to make for the improvement of the equipment of District Boards for this particular duty?—The District Boards have not got sufficient funds at their disposal.

37,015. That is the main trouble, is it not?—Yes, and unless they are financed, it is not possible for them to have the schools equipped as efficiently and adequately as they ought to be; unless they are helped by the Local Government in that matter, I do not think that any other process can prove fruitful.

37,016. What would you say to the proposal that the Government, on the advice of the Education Department, should be in a position to nominate to the education sub-committee of the District Board say one or two gentlemen, not members of the Board, who happen to be interested in education?—What would be the strength of that sub-committee? So long as they do not go beyond 25 per cent. of the members, it would be all right.

37,017. So you would favour the principle of nomination to that extent?—I would have no objection, provided the men that are put in are persons qualified to give advice on educational subjects and not those whom District officers want to pamper simply by giving them places of public distinction.

37,018. What do you find is the order in which public opinion, so far as it has developed in your district, is interested in various directions of expenditure? Do you find for instance that they are most enthusiastic about education, or about roads?—Since the constitution of these District Boards was reorganised, that is since 1922, there has been some awakening. Before that year we had only nominated members and the public had little to do with the working of the Boards except in so far as they were directly affected by the roads or the schools. There is, I think, a wider and a stronger desire for schools and roads than in former days and people know that they must approach the Board for these needs and, in my capacity as a member of the Board as well as of the Council, I have been receiving letters from time to time asking me to add to the number of schools, to improve the roads or to give more of them.

37,019. So that you do see signs of a quickening interest?—Yes.

37,020. Is most of this interest directed towards a particular subject, say roads or education?—There are three subjects which generally attract public attention, roads, schools and dispensaries.

37,021. That is to say, dispensaries for the population, not veterinary dispensaries?—Dispensaries for human beings, not for cattle.

37,022. Would you kindly turn to page 348 of your note? You point out that you think that there is a possibility of extending sheep breeding? I wanted to ask you about this sheep breeding in the Kumaon Division. What is the practice with regard to sheep-grazing on the hill sides?—The Kumaon division consists of the hills as well as the submontane tract. Of course there is no sheep breeding in the submontane tract, nor in the lower altitudes of the hill tract; there was a little but that has been stopped, because the Forest Department would not permit sheep and goats to graze in the reserved forests. So there is sheep breeding only in the higher altitudes which adjoin the Tibetan border and there they keep sheep and goats. They use them as beasts of burden for carrying goods to the lower territory and also they sell the wool.

37,023. Do the graziers who own these sheep shear them and bring down the wool to the factories, or how is the wool marketed?—Formerly it was all brought to some central places in Kumaon and was disposed of by the middle-

men. Now some of them enter into contracts directly with the Lalimli Factory at Cawnpore, while others, I am told, take their consignments even as far as Bombay and Calcutta; it is also purchased by the local men.

37,024. When you suggest there is opportunity for the improvement of the quality of this wool, are you thinking of selecting a better type of sheep? —Yes. One of my friends got some Australian sheep.

37,025. Do you happen to know what breed?—I do not know the breed, but he tells me they have been tried and are yielding wool of superior quality.

37,026. Are they the progeny of these Australian sheep and the local sheep?—The Australian sheep have stood the climate; there are very few of them so far, but they are thriving, and if the Forest Department permits their grazing in the forest, if a good number are imported and the Agricultural Department is able to point out the best localities for sheep breeding, I have no doubt the industry will flourish.

37,027. Have these crosses lived through twelve months, a whole season?— Yes, they have been there for two or three years.

37,028. Is the system of shifting cultivation practised at all in your district?—In my district there are various classes of people and even the methods of cultivation vary; in some parts, where there are primitive people there is a system of shifting cultivation in this sense that they occupy a village for three or four years, and then leave it and settle down somewhere else for the next three or four years.

37,029. But beyond that there is no particular tribe living by shifting cultivation?—No, there is not; there is rotation in the ordinary sense, with perhaps longer intervals here and there, but there is no shifting cultivation.

37,030. I want to take you one step further in the argument which you present on page 349 of your note in regard to Government in its action towards rural debt; you suggest that Government should liquidate the debt, that is to say, take over the debt, and recover it with interest at say 8 per cent. by means of easy instalments in the case of solvent agriculturists. I do not ask you for the detailed proposal that you would put forward, but I want to know whether you had considered the advisability, once the Government had taken that step, of limiting further borrowing?—Yes, I have said that.

37,031. You are definitely of opinion that that would be necessary?—Yes, I would adopt it, because if we leave the agriculturist free to contract debts to an unlimited extent after that, we should be giving him perhaps a licence to go upon what we have done for him.

37,032. I read your note carefully; you say that the cultivator, after the debt has once been redeemed, should not be allowed to raise any further loan except for real necessities. Of course, the real necessity for further borrowing would come at the very beginning of the next season; that is the difficulty, is it not?—I do not quite follow.

37,033. Having liquidated the debt and made arrangements to recover capital and interest, and assuming that that is a practicable policy, you leave your cultivator, of course, with the duty of refunding, on the scale agreed upon, what Government has, in fact, lent him; but, over and above that, he has to provide himself with capital to finance his next year's crop, has he not?—Yes.

37,034. Do you think the cultivator would be in a position to pay this 8 per cent. and to finance his next year's crop without further borrowing? —In most cases he must be able to do so.

37,035. That is your view?—I will give an illustration. At present suppose the agriculturist raises a crop worth Rs.200, and the creditor takes away

from him Rs.80 on account of interest at the rate of 2½ per cent. per month, and some Rs.20 on account of principal; he is short by Rs.100. For the same debt, the moment it is taken over by the Government I think he would be given a much longer time, so that the instalment that he has to pay would not exceed Rs.30, because the rate of interest would be very low and the principal would be distributed over a very long period; he would thereby be saving at least Rs.70. That Rs.70 he could divert to productive purposes, and I do not think he gets credit for more than that during the harvest time or during the period of one crop.

37,036. I want you, if you will, to develop your statement on page 350 of your note as to the damage wrought by wild animals in the forests in the districts that you know. What animals give the greatest amount of trouble in your district?—Deer and pigs mostly.

37,037. Which do most damage?—It depends on the nature of the crop and the season of the year.

37,038. Is there much loss of life from wild animals in the district? You say the number of men and women killed is tremendous?—It depends on the mentality of the person considering the question; one who is full of sympathy for human life feels staggered when he hears of 100 men being killed in the course of a year; another who is callous towards life, especially Indian life, would not mind it at all.

37,039. But I am concerned, if I can, to discover the sort of risk to human life that exists in your own district?—It is considerable in my district.

37,040. Can you give us the figures at all?—I could, but I have not got them just now; I could give it you from the reports.

37,041. From carnivora entirely, is it?—Yes.

37,042. Are there any accidents from pigs?—Last year there was one that I know of but the man was saved.

37,043. Have you read the report of the Oakden Committee?—Yes.

37,044. Do you agree in the main with that Committee's findings? If you would rather not commit yourself, please say so?—I do not think the methods of co-operation that are being followed can be effective, but, within the limitations that are imposed, they seem to give us some practical way out of the present difficulty.

37,045. Have you an active co-operative organisation in your own district? —Yes, there is one in some part.

37,046. Are there co-operative credit societies?—Yes.

37,047. Do you think they are healthy?—Yes, in my district, in the Tarai, they are healthy, so for as the question of credit goes.

37,048. Are the primary societies reasonably vigorous?—They are solvent.

37,049. Do their Committees take an active part in managing the societies? —I may just say how the relations between the officers and the people stand there; the estates belong to Government; the members of these bodies are generally the tenants of the estates, so that the Government officers are practically the landlords and these people are the tenants. They have been working under the guidance of the Government officers and they may have imbibed something of the co-operative spirit now, but these societies have been working mostly under the influence of the Government officers.

37,050. Do you happen to have taken any active part in the co-operative movement yourself?—Yes, I have been attending the annual meetings; I have been watching it closely.

37,051. Are you referring to the annual meetings of the Central Bank, or what?—Of the Central Bank, when the members of the various societies are

invited. There were some other societies which were started in the zamindari area, but the tract being precarious they did not thrive.

37,052. *Sir Henry Lawrence*: I see on page 346 of your note you advocate that advances should be made to educated young men for the establishment of farms?—Yes.

37,053. Has anything of that kind been done in any part that you know of?—A society was formed in Calcutta under the auspices of the Social Welfare League which I read about in the papers, but it was a private body. So far as this part of the country is concerned, I am not aware of any concrete instances. There has been some progress on these lines in other countries.

37,054. On what scale do you advocate that this experiment should be tried? What area of land would support these young men?—I am prepared to begin with a holding of something between 10 and 20 acres for one individual.

37,055. And you think he could make a living off that, do you?—It would depend on the use that he can make of that land; if he has got other means, if he has got enough capital, can resort to intensive cultivation and can find enough water, I think he can make a living.

37,056. Is there available, at the disposal of Government, land for this purpose?—In the malarial tract of Government estates the Government has got ample land.

37,057. In what district?—In my district of Nainital.

37,058. That is Government land, is it?—Yes.

37,059. You do not know the tenure there? Is it not *talukdari*?—No, it is Government land entirely at the disposal of Government, no one else having any interest in the uncultivated land.

37,060. You call it a malarious tract? Is malaria very serious?—Yes, very serious.

37,061. Could you get the young men to go there?—No; I would not advise them to go there so long as the climate is very bad.

37,062. You want Government first to improve the climate there?—Yes, for the benefit of the present agriculturists and for the benefit of those who may settle there hereafter.

37,063. What sort of measures are necessary for the improvement of the climate?—Better drainage, and removal of vegetation and other superfluous growth which is of no use to anybody.

37,064. Has any malarial survey of this kind been made?—Yes, there has been some survey recently and an officer has been working there, the Director of Malariology. He has submitted a report in connection with that but no action has yet been taken on it.

37,065. Do you know the financial aspect of this proposal, what it would cost to improve these lands from the malaria point of view?—It will largely depend on the area that is tackled.

37,066. Some scheme has been prepared; is that so?—I hope so; otherwise a man would not have been there getting a fat salary every month.

37,067. You have not seen such a scheme?—I have asked for it, but I have not yet got it.

37,068. On page 347 you speak of the tube well system, which cannot be said to have succeeded because of its prohibitive cost. Could you tell us anything about this tube well system?—It costs about Rs.14,000, on an average, to set up a tube well and the man concerned has himself to find something like Rs.8,000, the Government contributing something between Rs.5,000 and

Rs.6,000. The area that can be irrigated under it is not very large; unless there is intensive cultivation it is of no use; I do not think it would pay.

37,069. Who profits by these tube wells?—Those who are making the experiments can satisfy their curiosity.

37,070. Cannot you give us some information?—They are being tried with the best of motives. The zamindar on whose land it is set up profits to the extent that he can make use of the well.

37,071. He is getting a subsidy from the Government?—Yes; in some cases he gets a loan. In the case of every tube well there is some contribution by the Government, if not directly at least indirectly. A very huge staff is maintained, which costs a considerable amount.

37,072. Your view is that it is an unwise policy?—I think that, situated as we are, it is costing us too much.

37,073. Therefore it is unwise?—It is impolitic.

37,074. *Sir Ganga Ram*: To what depth do you go in the case of the tube well?—I do not know anything about the technical aspect of it.

37,075. You say it costs Rs.14,000; what is the size?—I have seen in the reports of the Agricultural Department that for an average well they provide Rs.14,000.

37,076. You do not know the dimensions?—I can give you the details from the report, but not from my own personal knowledge.

37,077. Is there any contractor for setting up these tube wells?—The method is this, so far as I am aware. The Government has got some engineers. Whenever a tube well is to be fitted, the man applies to the department who make a survey, prepare the plans and estimates, and if the man wants a loan he applies for it. Otherwise he looks into the estimate and provides the money himself. The work is supervised by the engineer maintained by the Government.

37,078. Whose tube wells are they?—Obviously the wells belong to those who bear the cost.

37,079. You can send us a note later on?—I will get you one from our Director of Agriculture.

37,080. He could not give us any figures?—Then in that respect I am no better posted than he is.

37,081. I think Rs.14,000 is much too high. The tube wells in our parts do not cost as much?—Perhaps they are too extravagant here; if you want a reference, I could give the reference from the report.

37,082. Can you send a memo?—I may do so, but I do not promise that I will, because I know very little about it myself.*

37,083. Do you know what methods they are going to adopt to exterminate malaria?—I understand they are going to appoint some doctors to improve the drainage.

37,084. The officer who is investigating is a doctor?—Yes.

37,085. Do you know what is the population there per square mile?—There are certain tracts where, for miles and miles, you will not find a single human being, and there are others well populated.

37,086. On account of malaria?—Yes, mostly.

37,087. Otherwise the land is good?—Yes, very fertile.

37,088. The water is good?—You can have wells and also irrigation canals in certain tracts.

37,089. Government is trying to colonise it?—No. There are some native inhabitants in those parts, and unless a regular stream of people comes from outside, there is dearth of population.

* Not received.

37,090. Outside people do not settle on the land?—They do not survive long, on account of malaria.

37,091. You are interested in education; up to what standard would you advocate education?—I would not impose any limits. I have no objection to everyone, who so wishes, becoming a graduate.

37,092. Everybody cannot be a graduate. When you start educating them wholesale, up to what standard do you educate?—I do not follow the question.

37,093. You say that the Government ought to start mass education; up to what standard do you recommend it?—Mass education is understood everywhere to mean primary education.

37,094. We have found in the last census report that the rural population, after two years of primary education, forget all about it when they go to their land?—I would not be surprised at it because most of the men drop out of the school after the preparatory stage.

37,095. You said just now that the Forest Department do not allow sheep grazing?—Yes, in their forests.

37,096. Is that right?—Yes, so far as I know of my parts.

37,097. That is the Tarai hills?—Tarai is a different place from the hills altogether. There are no hills in the Tarai and no Tarai in the hills.

37,098. *Sir Thomas Middleton*: You say that you have a small holding of your own. Does that mean that you are the owner of villages?—In our parts, fortunately, we have got the system of peasant proprietorship, and every individual has his own small holding.

37,099. You possess a small holding?—Yes.

37,100. But you do not work that small holding yourself?—No.

37,101. Do you own more than one small holding?—I do not know in what sense you are interpreting the word "holding." We have a few acres lying scattered about in the village; it is not a compact block.

37,102. What do you do with your land? Do you let it to some other villager?—Yes.

37,103. You yourself have no immediate connection with agriculture?—No; perhaps some would consider it undignified for myself, an educated man, to cultivate land.

37,104. You might have managed your land without compromising your dignity?—That I do in the sense that I get it cultivated by somebody who gives me something out of it.

37,105. But only this small area?—That is all.

37,106. So that your agricultural experience cannot be great?—No.

37,107. *Raja Sir Rampal Singh*: Do you think there is sufficient margin, in the income of a cultivator, between what he spends and what he gets on his cultivation?—I do not exactly understand what standard you apply to him. There are many people who are not getting more than a meal a day for working in the fields, and yet they make a certain saving on what they get out of the land.

37,108. I mean to say that, generally, the average cultivator seldom has any reserve?—He has not even the ordinary creature comforts.

37,109. If Government clears all the debts that at present hang over the cultivator, do you think that after some years his financial condition will greatly improve?—Yes.

37,110. Do you take into consideration all the calamities which the agriculturist has to face?—Yes.

37,111. If some calamity befalls him, will he be able to discharge the debt without incurring further debts?—If the calamity results in his own death, then there is an end of all the trouble; but if the calamity results in the failure of one crop, he can raise another later on and try to satisfy the Government and himself. Any way, he will be in a better position than he is to-day. His present position is inconceivably miserable, and I want the Government, specially with the aid of this Commission, to devise improvements for meeting the biggest of the questions relating to agriculture and rural economy.

37,112. What difficulties do cultivators in your part of the country have as regards grazing?—As I have already said, in areas controlled by the Forest Department the numbers permitted to graze are limited, so that a man cannot keep a larger number of cattle than he is permitted to graze. Goats and sheep are excluded altogether from the reserves, and inside the reserves certain areas may be closed altogether to grazing. If a man has no rights and his cattle stray into the forest, they are taken to the pound, and he has to pay heavy damages.

37,113. Owing to these difficulties, cultivators in your part of the country cannot keep as many cattle as they would like?—In those areas which are in the vicinity of reserved forests that is so.

37,114. *Sir James MacKenna*: You are a member of the Legislative Council in this Province?—Yes.

37,115. How long have you been a member?—Three years.

37,116. What is the attitude of the Council generally towards the Agricultural Department?—Most friendly and indulgent.

37,117. Would you say that agricultural questions are not regarded as matter for party politics in your Council?—No, or you would not find me here, as the leader of the Congress Party in the Council. Anyone who knows the condition of the cultivators cannot be deterred by political considerations from doing what he can for their relief.

37,118. What is the attitude of the Council and the public generally towards the Veterinary Services?—So far as the public is concerned, many people are not aware of the existence of either veterinary science or the Veterinary Department. So far as the Council is concerned, it has not taken a serious interest in the matter.

37,119. I suppose the position is that many members of the public have much more faith in the old customs than in improved veterinary science?—Most people do not know there is such a thing as improved veterinary science, so no comparison is possible.

37,120. That is the point. They rely on indigenous methods?—They do not know of others.

37,121. *Professor Gangulee*: You show a good deal of interest in agriculture, though not yourself an agriculturist. Are you a member of the Provincial Board of Agriculture?—No.

37,122. Are you in any way connected with any departmental activities here?—As a prominent representative of one of the foremost parties in the Council, I have to take an interest in all these things.

37,123. Are you a member of the Provincial Development Board?—No. It has been asleep for two years and has not held a single meeting. Some members of my party are on the Board. Ordinarily I do not enter the departmental committees.

37,124. When it started you could not forecast what was going to happen. Were you a member of it then?—No.

37,125. You suggest that a similar Agricultural Development Board should be started?—Yes, in the hope that it will be more active. It would be on different lines.

37,126. Have you any definite suggestions for making such a Board an active organisation?—By placing money at its disposal and allotting particular functions to it.

37,127. With regard to agricultural education, do you know the Cawnpore College at all? Have you visited it?—Yes, I have been there, but I am not intimately acquainted with its work. I have seen the massive buildings.

37,128. Do you know any agricultural graduates from that college?—A good number of them.

37,129. Do you know them intimately?—Intimately enough to know of their misfortunes.

37,130. What do you mean by that?—Their inability to eke out a living; their looking here, there and everywhere for something to do.

37,131. I take it the potato is the chief crop in your district?—It is one of them.

37,132. Do you know of any demonstration farm in that district where potato experiments are being carried on?—There is none.

37,133. When you say you want Government to liquidate the debt, do you mean the Central or the Provincial Government?—Unless the Central Government assists the Provincial Government, the latter will not be able to do it.

37,134. You want the Central Government to do it?—I want the Provincial Government to do it with the assistance of the Central Government, or the Central Government to do it with the co-operation of the Provincial Government. I do not mind which.

37,135. Referring to the question of export of grain crops: are you in favour of not exporting grain crops from this country?—If I could solve the other difficulties that would arise, I would be, but at the moment I consider it impracticable.

37,136. Do you think you could solve the economic problems of the country by prohibiting the export of grains?—If we could make the country self-contained in other respects, we could then think of retaining enough for our needs and not allowing any export except of the surplus.

37,137. Have you taken any part in the co-operative movement?—A little.

37,138. In what capacity?—You may call me either an organiser or a member; I have served as both. I have tried to start some societies, to arouse interest in them and get members for them.

37,139. Have you succeeded in your efforts?—So far as zamindari areas are concerned, our societies have gradually dwindled, and when people were carried away by the influenza epidemic some years back everything was swept away and the societies failed.

37,140. You have actually formed a society in your district?—A number of them.

37,141. I am talking of primary societies?—Yes.

37,142. Are you in touch with them?—Yes.

37,143. I suppose you took a great deal of interest in demonstration and propaganda at the time of the *khaddar* movement?—I did not take very much; I wish I could have, but I had too much to do at the time.

37,144. Do you think hand spinning and weaving could be universally introduced?—It depends on the mentality of the people who are approached.

37,145. What do you mean by that?—So far as the simple rural classes are concerned, if I go to them and demonstrate the utility of even the

few annas they might earn in their idle hours, they will respond to the call; but if I go to a haughty graduate, he may pooh-pooh the idea.

37,146. Was not intensive propaganda recently carried on to introduce spinning and weaving in rural areas?—Do you mean the Swadeshi movement?

37,147. I am referring to the Ghandi movement?—That was more comprehensive than the other.

37,148. Would you agree with me that intensive propaganda was carried on for the purpose of introducing spinning?—Yes.

37,149. That propaganda was supported by the Congress?—Yes.

37,150. What has been the result of that propaganda?—Conservative habits dies slowly. We have succeeded in demonstrating to some people the wisdom of adopting the mode of life which obtains in the villages, and we have perhaps induced some villagers to spend their idle hours in work rather than waste them, and we have set people thinking in proper channels.

37,151. Although you carried on intensive propaganda, you could not make very much progress?—I do not agree. The results so far have not been so great as we desired.

37,152. You expect results later on?—I am realising them.

37,153. I think you live close to a forest area?—In the midst of it, unfortunately.

37,154. You talk of constant friction. Are you referring to the friction of 1911?—It has gone on continuously.

37,155. It is still going on?—Yes.

37,156. What is the nature of it?—Large areas of open land were closed (something like 2,000 square miles), the number of cattle which could graze there was limited and the area over which cultivation could extend was restricted. The rules made for the exercise of the few privileges granted to people living in the vicinity were very stringent and the harassments of the lowest underlings were very difficult to meet. All these things contributed to the friction.

37,157. Do you speak of these things from personal experience?—Not as one of the victims, but as one who is very closely in touch with them.

37,158. *Sir Henry Lawrence*: Was this a new scheme of afforestation?—No, not so much afforestation as the reservation of existing forests.

37,159. Forests were newly reserved?—Yes.

37,160. In what year?—1911 to 1915.

37,161. What were they before?—Open forests, where the people had unrestricted rights. There has been some improvement since owing to the modification of the original scheme, and the friction is not so acute to-day as it used to be. Government has grown wiser, I think.

37,162. *Professor Gangulee*: You ask Government to build model villages in suitable centres. Has any model village been established by the prominent party to which you belong?—We have not yet taken over the government.

37,163. That is so; but as a non-co-operator, have you started any model village to show the people what they themselves should do?—We will do so the moment we get into power. Societies are being formed for this purpose in some provinces.

37,164. You are waiting for that?—Yes.

37,165. There is one sentence in your note which I do not understand. You say: "Apart from the moral and material drawbacks to the growth

of the co-operative system on normal lines on account of poverty, ignorance and lack of the spirit of self-help fostered by bureaucratic Government . . ." What do you mean by that last phrase? Who started the co-operative movement?—The Government.

37,166. What was the idea of the co-operative movement?—Government's idea was to improve the position of the cultivator, but there are basic causes working indirectly which hamper the movement.

37,167. Have you read the Maclagan Committee's report?—Yes.

37,168. They wanted to foster self-help among the people?—I consider it incompatible with the bureaucratic system of administration; you cannot develop that spirit. You want to make the people tame, docile and obedient, and your servants, when they go to a village, feel a little nervous about telling the people to rely on themselves and not to look to others for support; they feel they will be disturbing the administrative system if they create such a bold spirit amongst the people.

37,169. *Mr. Kamat*: As a member of a District Board, will you please tell me whether it is correct that District Boards, as a rule, hamper the Veterinary Services in carrying out their work of giving veterinary help to the people?—I do not think so.

37,170. We have been told that the Veterinary Department gets very little assistance from District Boards. If that is so, I want to know the reason?—At least that is not tantamount to hampering. We do not hamper at all. As to getting assistance I could not say that they get much assistance because much is never sought. I am prepared to admit that even the members of the Boards do not fully apprehend the potentialities of the Veterinary Department; but, as it exists to-day, it is not as useful as it ought to be, so the people have got only a lukewarm interest in it.

37,171. You say it is not as useful as it ought to be. Is that because it has not got the number of subordinates necessary for the area, or because the treatment which they give to the animals is not useful?—Because it has not got a sufficient number of subordinates and the subordinates that are there, are not always possessed of that genuine spirit of service which should inspire them.

37,172. Is there any prejudice or antipathy on the part of the villagers or on the part of the members of your Board against modern treatment according to veterinary principles?—There is no antipathy so far as those are concerned who know what veterinary science stands for, nor on the part of those who have actually derived some advantage from that sort of treatment. But there may be some sort of indifference on the part of those who are acquainted with it or who have not had occasion to try it.

37,173. Would the Local Boards like the control over the Veterinary Department to be taken away from the District Boards and vested in Government, or would they like to retain the control over that Department so far as the subordinates are concerned?—The District Boards would certainly like to retain that control.

37,174. You say in one of your paragraphs that agricultural experts should be inspired by a genuine spirit of service, understanding and sympathising with the unsophisticated Indian cultivator. From your experience do you think that the present Agricultural Department has not got any sympathy or does not behave with tact towards the cultivators?—I would not say that the department as such does not do so, but some individual members of the department are handicapped because of the want of knowledge; those who have not been living in the villages and who are not acquainted with the ways of the villager, do not behave towards him in such a manner as to win his sympathy and support.

37,175. Do you think there is scope for improvement in the attitude of the members of the Agricultural Department in this direction?—An immense scope, I should say.

37,176. *Professor Gangulee*: How many experts have you in this Province in agriculture?—There is the Agricultural Service, consisting of agriculturists to look after agriculture proper; there is a service of Agricultural Engineers to look after tube and masonry wells; there is a service of men in the Veterinary Department. I do not know exactly which you have in mind?

37,177. *Mr. Kamat*: You say there should be an adequate scientific staff for the necessary work of the Local Government and the Government of India may render financial assistance to them, which it should do, at least so long as it does not completely remit the provincial contribution fixed under the Meston award. Do you mean to suggest that after the provincial contributions are wiped off your Government would stand on its own legs without any help from the Government of India?—No, I cannot envisage that day; what I meant was that even if the Government of India say that this is a provincial affair and they are not statutorily bound to help us, they would still be under a moral obligation so long as they are getting a contribution from us to give us adequate assistance. I say that they must contribute but I cannot urge them to do so after the contribution which we are making to-day is fully remitted.

37,178. About your proposal that Government should relieve agricultural indebtedness through a development loan and with reference to the question asked you by the Chairman, I want some further light. After the debt is liquidated, you want to restrict the credit of the cultivator by legislation?—Yes.

37,179. And you say no further loan should be granted except for a real necessity?—Yes.

37,180. Supposing some real necessity arises, where is the cultivator to go to?—It will depend on the system that you set up; there can be a number of ways. If the Government directly liquidates the debts, then he may have to approach the Collector. There is another thing which the Government may do: instead of paying down the amount at once, the Government may undertake the liability or at least guarantee the payment of the debt by easy instalments by the cultivator.

37,181. Quite: but knowing rural life as you do, you know that the cultivator has to go to the moneylender for money, not only for agricultural operations, but also for social functions, ceremonies and such like things, which inevitably take place off and on. In such cases when the real necessity arises, is the cultivator to go to the Government also, when, for instance, a marriage takes place in his family?—My idea is this, that after you have liquidated the debts the cultivators should form themselves into a society, under legislation they should be bound to rather, and whenever any money is needed it is primarily the society which should consider the application of the man, and if it is satisfied with it, then recommend it to the man who represents the Government in its dealings with the society, who should, after he has satisfied himself, forward it.

37,182. So that a part of your proposal is an intervening society?—Yes.

37,183. What I am surprised to find in your proposal is this: you want legislation to restrict the credit of the cultivator here. In another place also, you suggest that improved implements should be given on the instalment system to the cultivator, and there again you want the Government to take a bond from him restricting his credit. Belonging to the school of thought to which you do, do you think that this system of binding the cultivator hand and foot and hypothecating his crops to Government is either

desirable or feasible?—Am I to answer that question from the political standpoint or from the agricultural point of view? I was not influenced by any political considerations in submitting my note and will not let myself be led away by any remarks of that character even now. We have to address ourselves to more serious business in spite of the differences in political views which exist between yourself and myself. So far as the other question is concerned, I think the agriculturist is not only bound hand and foot, but he is in fetters and chains under the present regime, and the suggestions that I am making will at least loosen those chains, so that if he is bound hand and foot to the Government even then there are many other chains which will be broken, and I am prepared to advise him to make that change.

37,184. This sort of proposal would not make his position worse, but better?—His position to-day seems to me to be hopeless. It will greatly improve if my proposals are accepted.

37,185. What are the restrictions in the matter of shooting wild beasts that you are referring to?—Nobody can shoot any wild beast inside a forest unless he has acquired a permit on payment of the requisite fee; and certain classes of beasts cannot be shot, even outside, during certain periods of the year. There are also other restrictions, of course: one must obtain an arms licence and few can get it.

37,186. Speaking about the manufacture of implements, you say substantial encouragement should be given to Indians for investment in manufacturing enterprises. Cannot private enterprise manufacture agricultural implements?—I mean private enterprise helped by Government support. I do not rule out private enterprise altogether.

37,187. Here again you want Government help?—Yes, I want Government to help the agriculturist, from whom it derives its revenues, so long as it continues to tax him. I am keeping politics entirely apart from my mind and will not be deflected in the least. Government is helping even such a huge concern as that of Tata's.

37,188. Speaking about the Workmen's Breach of Contract Act, you think the repeal of that Act has been disastrous for the people of this Province?—No, I have never suggested that.

37,189. What are you hinting at then?—At this, that there is no freedom of labour, and there is a shortage of agricultural labour in the parts mentioned by me; and the reason seems to me that the tract is not healthy and the fact that people should deplore the repeal of the Breach of Contract Act, which in itself is a wholesome step, indicates that unless they resort to artificial methods they cannot get their supply of labour.

37,190. *Sir Henry Lawrence*: I did not quite follow you. Did you say that the repeal was wholesome?—Yes.

37,191. How are the cultivators upset by that repeal?—Because so far as they are concerned they cannot make use of the provisions of that Act against the labourers who run away from the farms without discharging their liabilities now, and, as compared with their personal loss, they do not care to appreciate the larger bearing of that policy.

37,192. *Sir Ganga Ram*: I did not quite understand your answer to my colleague: Do you think that the cultivation of land is beneath your dignity? —No, I did not mean to be serious. I only meant to indicate that under the present system of education we get a false notion about our dignity and think that it is not proper for us to do such work; it has given us a false sense of vanity in that respect.

37,193. Do you think that such graduates would take to hand spinning and weaving?—Not only such graduates, but also members of Commissions as far as I am concerned. They can set an example for others.

Pundit Govind Ballabh Pant.

37,194. Are you a lawyer?—Yes.

37,195. *Professor Gangulee*: You propose to float a development loan. Where do you propose to float it, in this country or in England?—It will depend on the purposes for which it is taken; it will depend on the terms and how you can get the money and from which market. If you are driving at something else, I am prepared to tell you that if it is necessary to raise money in England for the purpose of developing this country I am not going to be deterred by any racial considerations in raising the money there. The question is addressed to my political sense, I fancy.

(The witness withdrew.)

The Commission then adjourned till 11 *a.m. on Monday, the 7th February,* 1927, *at Benares.*

Monday, February 7th, 1927.

BENARES.

PRESENT:

THE MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir THOMAS MIDDLETON, K.B.E., C.B.

Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O

Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.

Mr. H. CALVERT, C.I.E., I.C.S.

Professor N. GANGULEE.

Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Dr. RADHAKAMAL MUKHERJEE, Ph.D., Professor and Head of the Department of Economics and Sociology, University of Lucknow.

Replies to the Questionnaire.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The evil of excessive fragmentation has been the result of the agnatic principles of succession among male heirs and the desire of equality, each co-sharer on a partition insisting on a separate share in each quality of the land in the village. Formerly the cultivation unit was the joint family land and partition was uncommon; now the economic solidarity of the joint family has been affected by the importation of individualistic notions of property. Indeed, the tendency towards sub-division which has been manifest in India only during the last few decades has been the outcome of the interpretation of Hindu and Mahommedan Law by English judges, with their strong predilections for individual succession to and private enjoyment of rights in land.* It may now be necessary to check repeated partition and wide distribution of scattered holdings by modifying the law of succession. The danger of morcellement has been found in one of its worst forms in France where the peasantry limit the size of families to maintain a not very high standard of living. In parts of Spain it is not uncommon to own and farm 16 or 17 acres divided into 80 to 120 plots scattered over a radius of three miles, and in another part (Vigo) there are many isolated parcels of 35, 25 or even 12 square yards.†

European measures against partition.—The problem is thus not peculiar to India and everywhere the social and economic effects are much the same. Let us examine briefly the attempts made by the agricultural countries in Europe to check repeated partition and wide distribution of scattered holdings. In Germany, the law encourages the practice among peasants of succession to undivided properties by the creation of a preferred heir (*Anerbe*). The laws creating an *Anerbenrecht* seem to be generally facultative, *i.e.*, permitting, but not compelling, the registration of a property as subject to their provision; they apply to intestate succession only, and then only give the one heir who takes over the property OF a certain preference

* For a full description of the question see Mukerjee: *The Foundations of Indian Economics.*

† Irwin: *The Making of Rural Europe.*

only in the proportion he shall receive (varying from State to State) directing that the others shall be compensated according to the agricultural profitableness of the estate and not its selling value. Partly for this reason and partly because the single recipient is given a larger share to begin with, the new law somewhat lessens the tendency of the peasants to incur debt on succession to a property. Nothing in the law prevents an owner from disposing of his property during his lifetime or by will; but the law of intestate succession undoubtedly strengthens the hold upon the peasant mind of his inherited preference for single succession to the farm. In Denmark the reconstituted State small holdings can be sold, but they cannot be subdivided, and the existing law puts insuperable difficulties in the way of adding one holding to another so as to make a large farm. Legally the owner can determine by his will which child shall succeed, and the value at which the farm is to be taken over and the other children compensated. To prevent the overburdening of the new farmer, the valuation laid down in the will may be below the "true value," *i.e.*, the price at which it could be sold. There is, therefore, in the law a recognised preference for the chosen heir as in Germany for the *Anerbenrecht*. If the parent dies without disposing of the succession by will or otherwise, the State carries through a transference on the same principles. But, in practice, the matter is almost always arranged during the parents' lifetime. The farm very generally is transferred to one of the children, after a family council which comes to an agreement as to how much the preferred heir shall pay to the other heirs, and how much to the parents, in addition to their board and the exclusive use of some of the rooms in the farm-house. In most parts of Austria it is usual for the farm to pass to a single heir without any division of property and for a settlement to be made with the co-heirs by an indemnity in the form of a sum of money or mortgage. This practice is a survival of ancient Germanic law, the idea of which still is rooted deeply in the popular mind. As a rule, either the oldest or the youngest son inherits, according to the local custom. Even in those parts where a division of holdings is customary it is the rule that certain shares should be disproportionately large and that the heirs who have received less land should be compensated by a money payment. Generally speaking, the custom in Europe is to leave the property to a single heir, who gradually pays off the charge laid on it by the father for the benefit of the other heirs. If he finds the property unprofitable, he sells it undivided. Thus the size of the holdings does not diminish.

In Denmark the law of 1906 forbade the reduction of the area of a peasant farm below a certain taxable value which is roughly estimated as from 25 to 125 acres, but allowed these farms to be of four grades, a separate minimum being fixed for each grade. According to a new law which is now being proposed, no peasant farm, as existing at the moment of the passing of the law, may be extinguished or diminished in area without the sanction of the Ministry of Agriculture, and the period for which a farm or part of a farm may be leased without the sanction of the Ministry of Agriculture, is reduced from fifty to ten years. A small holding may not be extinguished or diminished in area below the minimum fixed for its grade, except with the sanction of the Ministry, and in the public interest evidently sanction will not be easily obtained in the case of a small holding. The four classes remain based on taxation, and equal to areas from about 12 to 35 acres; the smallest holding of rich land, down to 2½ acres, will be reckoned in the 12-acre class. No holding may be less than 2½ acres. Three small holdings up to about 30 acres in all of fairly good land may be held by one person, but the building must be maintained and no holding may be merged in another. The land is graded by official valuers, and official Inspectors watch over the observance of the law. Fines up to 2,000 kr. may be imposed for its breach.*

* Strickland: *Studies in European Co-operation*, Vol. II., Chapter V.

Thus, the Danes are contending against the evil of excessive as well as of inadequate size of holdings. Their measures prevent the sub-division of land below a limit which draws the line between the economic and the uneconomic holdings. These also seek to protect the peasant or the smallholder from being swallowed up by the wealthy from whom they have been carefully acquiring the land for settlement. According to the Russian Agrarian Code, 1922, the division of the lands among the family is allowed only when it is probable that new farms will be established for the benefit of the members who are withdrawing on lands which are assigned to them in the course of the division; if this is impracticable the movable property only is divided. To prevent such division as would destroy established farms by dividing them into two small units or otherwise impairing their efficiency, the Provincial Executive Committee, on the proposal of the provincial agricultural authority, has power to issue compulsory orders for limiting the excessive sub-division of farms. The lines of these measures are laid down in advance by the Commissariat of Agriculture. A member, on withdrawal from a holding which has been declared indivisible, has the right to claim payment in money or in kind for that portion of the stock that belongs to him, but not for the land share.*

It must be admitted that legislation of this character, though calculated to divert the surplus population from the land, would introduce a new principle into the land policy of India, where the idea of equal inheritance by birth-right has taken firm root in the popular mind. But the straits to which agriculture has been reduced as the result of the disparity between the increase of population and the capacity of the soil to feed it demand a drastic remedy. At present, in the more populous parts of the country, the conditions of agriculture are such that it is no longer profitable, yet the peasant, having no other occupation to fall back upon, tries separately to make both ends meet by continuously lowering his standard of subsistence, till he reaches very verge of starvation. At the same time, there is witnessed a condition of chronic under-employment in the villages. The burden of a disproportionate amount of semi-idle, inefficient labour lowers the efficiency of agriculture and delays the introduction of scientific processes and machinery. The introduction of a more elaborate rotation of crops or of subsidiary occupations or industries of a non-agricultural character no doubt would mitigate the problem of agricultural idleness which always co-exists with a low standard of living. Emigration or drift of the surplus population to the industrial centres of the country would similarly react on the conditions of agriculture and endow the people with greater staying power. Thus, the re-organisation of agriculture and industrial development of the country must accompany schemes of consolidation. In India we are apt to be misled by the ideas and practice of English agriculture, without considering the differences of economic circumstances between the two countries. Professor Jevons, for instance, advocates a policy of consolidation on the lines of the English Enclosure Acts. In the United Provinces, the density of population is three to four times higher than in England, and large farms cannot but mean expropriation and widespread distress in the absence of better opportunities of emigration and of industrialism. In England, large farms, large fields, straight fences, &c., have been for long a favourite scheme of English landlords and English writers, and no doubt, where there is capital and no redundant population, such arrangements are very desirable, but it should be remembered that to these large farms and large fields England owes her own Poor Laws.† Thus, a new land policy inaugurated by a

* M. Tcherknisky: "Agrarian Policy in Soviet Russia," *International Review of Agricultural Economics*, October–December, 1924.

† George O'Brien: *Economic History of England.*

change in the system of succession which would divert surplus population from the land requires to be introduced with caution, especially in regions where the density of population is extraordinarily high. Again, the scarcity of water supply is one of the most significant limiting factors in Indian agriculture. Where cultivation depends upon the uncertainties of rainfall, the scattered distribution of holdings in different soil areas is itself an agricultural advantage. In many parts of India we find that two or more staple crops are grown in dispersed fields in different soil areas, so that while a deficiency or an irregular distribution of rainfall may destroy one crop, there may be favourable returns from other fields. Indeed, the elaborate system of crop rotation which distinguishes Indian from Western farming has been possible chiefly because the holdings are dispersed. Thus, schemes of consolidation which do not take into account the local water and soil resources governing the field system and agricultural practice are bound to fail. The introduction of supplementary occupations and utilisation of raw materials in village workshops would smooth the transition from the old system of agriculture, handicapped by the pressure of population to a new economy where the soil would no longer be burdened with a population greater than it can support. In Belgium, the established custom is that the peasant family deputes one of the members in an annual rotation to undertake either industrial labour in the city or agricultural labour on another peasant's land. With increased size of holdings there must also come greater facilities of credit and better equipment than what the smallholder now possesses. In many tracts, one of the reasons why holdings are small is that few cultivators possess the necessary capital for purchasing the cattle and equipment adequate for farming on a large scale.

Thus, in India, we might introduce tentatively, as a first measure, legislation which would compel all villagers to accept restripment when a majority desire it. In Austria the scheme is forced on the rest if 66 per cent. of the cultivators agree to it; in Switzerland this is done if approved by 66 per cent. of the cultivators representing more than half the land, while in Prussia and Japan a bare majority coerces the rest.

Consolidation of holdings in Baroda.—In Baroda a permissive Act for the consolidation of agricultural holdings was passed in 1920. It cannot be made applicable to a village except when the two-thirds of the number of its total *khatedars*, who are the holders of not less than half of its total land desire to have it applied to their village.* Secondly, after readjustment the reconstituted holding, which will be the economic holding, should be regarded as indivisible.

The right of pre-emption has become customary law in many parts of India and should be made applicable to the economic cultivation unit. Thirdly, the economic holding will be held by the head of the family as family property, and regarded as impartible and exempt from seizure for debt, involving the consequence that a loan cannot be raised on the security of the holding. Fourthly, on his death, a preferred heir would succeed to the undivided economic cultivation unit and compensate the other heirs according to the agricultural profitableness of the farm and not its price at the land market. It has been suggested by the Baroda Land Holdings Commission that, with a view to prevent sub-division by succession or the separation of members of joint families, the inalienable holding, when succession opens out or a separation is being effected, should be sold at an auction at which only the co-sharers or reversioners should be permitted to bid.† This practice, however, would but lead to under-bidding

* *The Bombay Co-operative Quarterly*, December, 1923, "Consolidation of small and scattered holdings."

† Misra: "Report on the proposed consolidation of agricultural holdings," *The United Provinces Gazette*, May 31, 1924.

and over-burdening of the new cultivator, which would be a serious difficulty on account of the tendency of every member of the Indian cultivating family to keep a hold on the paternal estates. Thus, the German practice of the creation of a preferred heir and the compensation of the other members of the joint family according to the margin of agricultural profits and not the price at which the land can be sold seems more suitable to Indian conditions and this would not lead to any bitterness, while proving an incentive to an active and thrifty life on the part of the members of the cultivating families. A man may hold more than one of such readjusted economic holdings; but mortgages, sub-letting and other transfers tending to bring about sub-division should be prohibited.

Consolidation by voluntary exchanges.—In *pattidari* villages in Northern India, where the co-sharers are on good terms, voluntary exchanges of scattered parts of land and proprietary rights with the object of consolidating *quras, thoks* or *mahals* should be encouraged. *Chak-bat* (compact) partitions have been kept in view by the Board of Revenue, the United Provinces, and might still further be carried out whether the partition be perfect or not. Such partition may work on the basis of valuation as in Aligarh, thus modifying the allotment of various soil areas to all the *pattidars* in proportion to their shares. The Commissioners of Bareilly, Benares and Allahabad seem to have issued administrative instructions with a view to prevent *pattis* of smaller size than 5 acres, 25 *bighas* and 10 acres, respectively. But since the law prescribes no limit to the size of *pattis,* it is obvious that such instructions cannot achieve the desired end. Many District Officers report that *ichet-bat* operations are still the general rule, although in some partition proceedings lip service is done to the theory of *chak-bat* partitions by stating that the partition will be *chak-bat* as far as possible. The parties generally are averse from *chak-bat* partitions and the Partition Officers usually meet their wishes on the principle of least resistance. To induce the parties themselves to accept *chak-bat* partitions the District Officer of Ghazipur has introduced a plan of asking them to fix their own valuation as far as possible on the different kinds of land in terms of one another; as, for example, so many *bighas* of fallow land are equivalent to so many *bighas* of occupancy land, and so on. A similar method has been adopted in some of the doab districts with success, and the experiment deserves wide trial.* It must be pointed out that the intelligent and substantial cultivators in different parts of India adopt such practices to check the evil effects of the customary laws of inheritance and statutory laws of partition which combine to promote sub-division of the most extreme type. Thus, the secret of the success of the more prosperous cultivators lies in a determined adherence to the joint family system; the family affairs are managed by a *malika* who is selected as the most capable member of the family. If any member insists on partition, naturally, under Hindu Law, he is entitled to it, but every effort is made under the persuasion of a panchayat to divide up the property so as to accommodate the deserter in a different village.† Any legislation which would give a majority of villagers the option of preserving and even making compact holdings must accordingly find solid support in present habits and intelligent backing among the principal cultivators.

Regulation of exchange and partition.—Moreover, cases of exchange of contiguous rural property should be exempted from the usual stamp and registration charges as in some of the agricultural countries of Europe. On the other hand, transfers of agricultural land below the fixed standard should be refused registration if such transfer is not made to the co-sharer

* Government Resolution on the Revenue Administration, 1922-23, page 17.

† Knox: Report of the Revision of Settlement in the Gorakhpur District, the United Provinces, 1919.

or to the owner of the adjoining fields. Again, the courts should not allow the partition to be made if by so doing any of the shares would be of a lesser area than that fixed for a representative economic holding. Already in the Bombay Presidency the necessity for a limit for sub-division has been recognised. The limit fixed varies in different tracts and for different classes of land. In Gujarat it is one acre for dry crop land and half-acre for garden and rice land. Such limits are, however, too low and require to be raised in the interests of efficient cultivation. The conditions have become complicated in the zamindari provinces, where on account of the absence of fixity of tenures, such as exists in Agra and Oudh, the peasants have no desire to improve their holdings. Thus, the better and inferior class of tenants occupying medium or small sized plots of land are virtually in the same economic position, and there are constant transfers of holdings. Such economic circumstances perpetuating tiny holdings which are not economically self-sufficing are true not merely of Bengal, Behar and the United Provinces, but also of all areas where there has developed a long chain of middlemen dependent upon land. In many of these areas the introduction of economic holdings necessary for agricultural progress is impossible without a change in the land and revenue law. This, again, is impossible without the growth of a sound public opinion in regard to occupancy and non-occupancy rights and the social necessities of agriculture. An exchange or consolidation of holdings is impossible under the existing Tenancy Law of the United Provinces since occupancy tenants cannot be bought out. Where the land system stands in the way of restripment and consolidation, we have to depend upon the traditions of voluntary social co-operation. Such methods of solution are witnessed in the south, where there are villages which are re-divided annually. But the tendency here is more marked because of the established communal tradition. Thus, in Tanjore there are larger fields and holdings than in other districts. This points to a gradual consolidation of holdings under the supervision of the village panchayats, which also supervise the equitable distribution of irrigation water, the maintenance of village public works, &c. The exchange of plots of land so as to give the different owners contiguous blocks so far as possible is called *parivarthanai* (Sanskrit—exchange) in Tanjore. It is difficult to come to an agreement because the advantages of plots as regards fertility, distance, irrigation facilities, &c., have to be equalised; and sometimes the rich peasant would refuse to exchange in such a way as to convenience a small neighbour, and the small owner is often at the mercy of his rich neighbour.* Similarly, in Travancore, consolidation of holdings is taking place, the tendency being for the owner of very small plots of land to sell them or to take more land on lease from others and thus enlarge the unit of cultivation. It may be advisable for the Government to initiate an experiment by acquiring villages under the Land Acquisition Act, re-align them properly, provide proper drainage and irrigation channels and then relet to the original tenants. This would furnish a valuable object lesson, though such lessons cannot serve the purposes of legislation or voluntary adjustment by the villagers themselves.

QUESTION 8.—IRRIGATION.—A careful examination of statistics of rainfall, irrigation and cultivated area in the United Provinces reveals, on the one hand, the striking dependence of agriculture on the monsoon conditions, and on the other, the limits of irrigation. From 1886-87 to 1894-95, there was an abundant rainfall in the Province, the average for nine years being 44·06 inches. This cycle of wet years was succeeded by two dry cycles, each of ten years' duration in the first of which the average rainfall was 37·33 inches and in the second 34·49. Molony† has given the following table

* K. Soundara Rajulu in *South Indian Villages*, p. 80.

† Molony: "Rainfall, Irrigation and the Subsoil Water Reservoirs of the Gangetic Plain in the United Provinces." *The Agricultural Journal of India*, January, 1917.

showing in acres the average areas irrigated during the same three periods:—

Cycle.	From wells.	From canals.	From tanks and other sources.	Total irrigated area.
Wet cycle	3,898,746	1,345,396	2,813,337	8,057,479
First dry cycle	5,293,490	1,900,037	2,501,084	9,694,611
Second dry cycle ...	5,921,314	2,299,310	1,991,204	10,211,828

With an abundant rainfall in 1916-17 there was a smaller demand for water than in the preceding year. This is shown by the following:—

——	From wells.	From canals.	From tanks and other sources.	Total irrigated area.
1916–17 ...	5,531,295	2,398,068	3,069,786	10,999,149

The area irrigated from tanks was greater and the area irrigated from canals and wells less in the cycle of wet years than in the cycles of dry years. In the second dry cycle the increase in well irrigation was 52 per cent., and in the canal irrigation 72 per cent., while the decrease in the tank irrigation was 29 per cent. In 1916-17 the total number of wells actually used was smaller than in the previous year and only 12,072 new wells were built as compared with 14,350 in the previous year and 19,692 in 1914-15. Since the beginning of the first dry cycle there has been a steady effort to improve the protection in areas dependent on wells. Between 1897 and 1917 no less than three lakhs of masonry wells have been constructed.

The result of this may be seen in the extremely dry year, 1913-14, when the rainfall was actually less than in 1896-97. In 1913-14 the total area under wheat amounted to no less than 6,376,670 acres, as compared with 4,931,710 acres in 1896-97. The serious failure of the crops witnessed in the latter year is almost impossible. With a continuance of heavy monsoons irrigation from wells shrinks owing to the labour and expense of lifting water. On the other hand, tank irrigation shrinks greatly during years of drought owing to tanks failing to fill.

But the two dry cycles have undoubtedly left the Provinces with a very much less efficient system of protection both in the matter of wells and canals. A comparison of the figures of canal and well irrigation now and at the end of the dry cycles will be of great significance:—

——	From wells.	From canals.	From tanks and other sources.	Total irrigated area.
1886–1887 ...	5,921,314	2,299,310	1,991,204	10,211,828
1923–1924 ...	4,252,443	1,635,865	1,994,574	7,946,258
1924–1925 ...	4,308,915	1,900,664	2,249,782	8,459,361

There has been a diminution under well irrigation by more than one-half million acres. In the first place, as ponds and *jhils* had sufficient water owing to abundant rainfall there was less need of sinking earthen wells than in the years of drought. Secondly, in areas such as are met with in Muttra, Agra and Etawah districts the deep water level has made well irrigation an expensive matter. Indeed the protection of these precarious tracts raises

some rather serious engineering problems and the former methods employed, which consisted mainly of assisting landlords with advances, are not likely of themselves to be successful. The zamindar unaided by an engineer, will not be able to cope with the difficulties to be encountered, or to spend to the best purpose advances made to him for improvement of water supply. It may suffice to mention that in one tube well sunk in the Muttra district it was necessary to go down 350 feet before an adequate supply of water could be obtained. A comparison of statistics of well irrigation in Agra, Muttra and Etawah districts shows a continuous and steady decrease in the number of masonry and non-masonry wells. Doubtless in years of good rainfall this decrease is arrested but the relief is only of a temporary nature.*

Number of Wells.

District.	Year.	Masonry.		Non-masonry.	
		Actually used.	Available.	Actually used.	Available.
Agra	1924–25	6,390	12,110	23,165	43,059
	1916–17	6,885	11,667	32,362	57,762
	1911–12	7,015	11,244	36,489	58,508
	1905	—	10,500	—	—
	1875	—	8,056	—	62,566
	1840	—	5,263	—	—
Muttra	1924–25	3,150	7,261	11,276	20,876
	1916–17	3,503	6,993	15,526	26,838
	1911–12	3,417	6,521	15,290	23,387
	1907	—	9,847	—	25,000
	1879	—	4,999	—	35,151
Etawah	1924–25	4,367	7,523	8,253	11,475
	1916–17	4,255	6,614	12,887	15,812
	1911–12	4,330	6,506	11,775	15,464
	1907	4,408	6,047	12,393	15,057
	1875	1,067	—	33,794	—

The character of wells depends upon two factors, namely, the depth at which the water is found and the nature of water. Where the water-level is low, well irrigation becomes more expensive and shrinks. Again, where the water found is distinctly brackish, it is unfit for use in tillage. Brackish water can be employed for growing crops but is useless for preparing land for ploughing, as the salt prevents the seeds from germinating. Local experience has divided the water into twelve classes. Some of these are distinctly injurious to crops while others are not so when other seasonal conditions are favourable. In some tracts there has been an enormous fall in the well water level. In 1879 the depth of water in the Trans-Jumna tract ranged from 30 feet in Mat to 40 or 45 feet in Mahaban and Sadabad in Muttra district. In Western Muttra, near the Jumna ravines and Chhata hills, it was again about 30 feet, but along the centre line between these points it ranged from 45 to 60 feet. Since that time important changes have taken place. Owing to the famines of 1897 and 1900, the water-level sank considerably in eastern Muttra; and since the latter year its average distance from the surface has been computed at 50 feet in Mat, 60 feet

* *Season and Crop Reports of the United Provinces*

in Sadabad, and 75 in Mahaban. It cannot yet be decided how far it has risen in this portion of the district since the construction of the Mat canal, but in western Muttra the water level is now found to depend entirely on position with reference to canal. In the *ghat* tract in Etawah district the water-level varies from 60 to 80 feet, while in the *kurka* and in the *par* it was at so great a depth as to preclude practically all possibility of irrigation. The first of these tracts has now long been influenced by the canal, and considerable changes in the water-level have taken place but the water level in the *ghar* has not been appreciably affected by the construction of the Bhognipur branch. In Agra district the water-level is always very low in the high line tract above the Jumna. Across the Utangan in Bah, the depth at which water lies is very great, ranging from 60 to 80 feet in the west and from 80 to 100 feet in the eastern half; but the subsoil is usually firm and well construction is not hampered by the presence of sand as in Kiraoli. In south Khairagarh the water level has sunk considerably of late years, and is now about 35 feet below the surface on an average; while the nature of the soil frequently renders the construction of unprotected wells impossible. As the water level recedes in a particular tract, the cost of well construction increases and well irrigation shrinks. Taking the Province as a whole the irrigated area amounts to 30 per cent. of the total cultivated area. Of these 15 per cent. is irrigated from wells, 7 per cent. from canals and 8 per cent. from other sources. Wells are thus the main source of irrigation, supplying about 50 per cent. of the area irrigated, while canals and other sources supply about 20 per cent. each.*

	1895.	1925.
Total cultivated area	32,600,000	34,900,000
Irrigated area	10,211,828	8,459,000
From canals	1,900,037	1,900,000
From wells	5,293,490	4,252,000

On the whole, we find that while there has been a very large increase in the well irrigated area, the canal irrigated area has not only not increased in the same proportion but has remained as before. It appears that the limit of canal irrigation has been reached. At present over half the irrigated area in this Province is indebted to wells for water, and those parts of the Province which lend themselves readily to well construction are adequately provided. But the occurrence of dry seasons, as we have noticed, further stimulates well construction, a favourable reason leading to a relaxing of effort. In 1911-12 there was drought in the Provinces in the early months of the *kharif* and the agricultural situation became full of anxiety. But as the season was on, conditions improved and the *rabi* crop was a great success. The short rainfall in the *kharif* season led to an increase of the irrigated area of that crop by 32 per cent. In 1924-25, the winter rains were deficient in the Provinces. This led to a resort to irrigation in a larger measure. The net irrigated area went up from 79.46 lakhs of acres in 1923-24 to 84.59 lakhs or 6·5 per cent. The area which received water from the canals rose from 16.35 lakhs to 19.00 lakhs of acres, the area irrigated from wells from 42.52 to 43.09 lakhs, and that from ponds and other sources from 20.58 to 22.50 lakhs. The increases were 16·2, 1·3 and 9·3 per cent. respectively. The number of masonry wells rose from 742,421 to 748,781, while that of non-masonry wells diminished from 636,765 to 596,393. As ponds and *jhils* had sufficient water owing to excessive rains, there was

* *Season and Crop Reports of the United Provinces*, 1911-12 and 1916-17.

less need of sinking earthen wells. During the famine of 1907-08 the area irrigated from wells increased to three times that which was irrigated from canals. The canals are mainly supplied from the rivers arising in the hills. Of these the Jumna and Ganges canals already use the total supply of these rivers while the Sarda Canal is now under construction. In the south the streams arising in Central India irrigate an area of about 1.75 lakhs of acres. The perennial rivers have thus been or will shortly be put to their fullest use and any large extension in this direction cannot be looked for.*

It thus appears that there is an increasing dependence of agriculture, with the continuous multiplication of population not upon the rivers but upon the subsoil reservoirs, the engineers having already almost exhausted the supply of water available in the rivers which serve the United Provinces. An additional drain necessary for the annual well irrigation of two million acres implies that there must be less steep gradient in the subsoil water now than thirty years ago, and that there is a permanent tendency towards a fall in the subsoil water-level. The only possible method of checking the fall in the subsoil water-level is to save as much as possible of the rain water or canal water which at present runs off into the rivers. Molony suggests the following measures as possible remedies: (1) It might be arranged that at times when there was not a full demand for irrigation water the canals should utilise their surplus in filling tanks instead of running it to waste. Irrigation done from tanks so filled might possibly be charged at a lower rate so as to encourage villagers to get their tanks filled up. (2) In undulating country, an extension of the existing practice of constructing field or ravine embankments might do much to save water. (3) Attempts might also be made to get a more direct and rapid flow of surface water into the subsoil by excavating swamps or wells in the beds of tanks or streams thereby making a direct communication between the surface water and the sand beds in the subsoil. It is not impossible that drainage into the subsoil would be found to possess nearly all the advantages of surface drainage without its great drawbacks. (4) There remains, lastly, the keeping of all land under the plough. This would probably be the most efficacious method of all but the cost would, of course, be immense.

A great saving in water might be effected by piping or lining the water-channels. At present there is great loss of water due to evaporation and percolation in earthen channels. In many villages channels lined with roof tiles may occasionally be seen, especially where the water is to be conducted to long distances and along more porous soils. The fall in the water level reacts very unfavourably upon irrigation. In many tracts a considerable fall has rendered useless a large number of existing masonry wells. It has greatly increased the cost of constructing new wells as well as of the labour and cost of lifting the water to the surface. The use of mechanical power to pump water from the subsoil is thus one of the most urgent measures for agricultural improvement. There is no doubt that the slow but steady fall in the subsoil water level noticed in some parts of the United Provinces will inevitably lead to the adoption of power pumping for irrigation on which the whole future of irrigation depends.

The following figures for the years 1911 to 1925 illustrate not only the remarkable dependence of agriculture on well irrigation in the non-canal districts of the United Provinces but also the extreme limit which well-irrigation has reached in spite of a lowering of the water-level and other difficulties.

* Leake: "Trend of Agricultural Development in the United Provinces," *Agricultural Journal of India*, 1923, p. 13.

Progress of irrigation in the non-canal districts.

District.	Year.	Total net cropped area.	Estimated irrigable area.	Well irrigated.	Irrigated from other sources.	Total irrigated.	Per cent. irrigated to estimated irrigable area.
Budaun ...	1911–12	970,151	272,000	60,535	27,105	87,640	32·2
	1916–17	995,334	295,000	131,997	66,469	198,456	66·1
	1924–25	878,927	305,000	24,566	—	24,566	8·2
Moradabad...	1911–12	1,084,035	217,000	36,898	4,146	41,044	18·9
	1916–17	1,115,912	221,000	89,214	46,472	135,686	62·9
	1924–25	1,041,076	227,000	35,827	2,493 1,459 Canals	38,320 1,459	16·7
Shahjahanpur	1911–12	779,097	254,000	87,132	48,368	135,500	53·1
	1916–17	799,720	256,000	155,369	87,964	243,333	95·0
	1924–25	737,453	260,000	33,201	16,414	49,615	19·3
Benares ...	1911–12	471,317	185,000	108,001	25,322	133,323	91·9
	1916–17	483,185	195,000	148,371	37,824	186,195	95·3
	1924–25	474,643	207,000	131,038	10,229	141,267	68·0
Mirzapur ...	1911–12	711,602	110,000	31,654	21,677 40,500	53,331 40,500	85·4
	1916–17	766,714	219,000	34,887	23,340 53,946 Reservoirs 11,005 Canals	58,227 — 64,951	56·1
	1924–25	663,620	175,000	25,847	9,750 52,611 18,296	35,597 — 70,907	65·7
Jaunpur ...	1911–12	628,291	417,000	184,014	53,335	237,349	56·7
	1916–17	652,748	442,000	293,410	72,404	365,814	82·8
	1924–25	648,744	476,000	295,149	43,612	338,761	71·2
Ghazipur ...	1911–12	601,419	253,000	124,817	61,338	186,155	73·5
	1916–17	618,885	263,000	154,959	73,008	227,967	86·7
	1924–25	612,646	273,000	142,439	43,834	186,273	68·0
Ballia ...	1911–12	529,893	232,000	130,484	51,401	181,885	78·4
	1916–17	538,406	249,000	147,572	56,219	203,791	81·9
	1924–25	541,029	268,000	136,164	49,344	185,508	69·0
Gorakhpur...	1911–12	2,123,966	803,000	255,776	297,247	553,023	68·8
	1916–17	2,124,909	831,000	399,319	310,909	710,228	85·4
	1924–25	2,129,881	939,000	414,371	373,855	788,226	83·9
Basti ...	1911–12	1,269,856	711,000	119,219	228,513	347,732	48·9
	1916–17	1,271,325	730,000	306,230	270,063	576,293	78·9
	1924–25	1,311,357	770,000	211,748	397,168	608,918	79·0
Azamgarh ...	1911–12	857,466	528,000	183,479	195,991	379,470	71·8
	1916–17	901,125	559,000	261,628	243,253	504,881	93·9
	1924–25	902,172	601,000	276,104	204,310	480,414	79·8
Bahraich ...	1911–12	976,138	91,000	9,159	40,201	49,360	54·2
	1916–17	996,907	100,000	27,699	63,106	90,805	90·8
	1924–25	955,580	102,000	11,811	50,384	62,195	60·9
Gonda ...	1911–12	1,156,553	341,000	61,727	50,869	112,596	33·0
	1916–17	1,181,004	366,000	197,575	132,150	329,725	90·0
	1924–25	1,157,952	389,000	161,044	128,589	289,633	74·5

A scrutiny of the above figures goes to show that the percentage of irrigated to estimated irrigable area in most of the non-canal districts of the United Provinces has reached a very high figure varying from 65 to 95 per cent. It is clear that the limits of well irrigation have been nearly reached under the existing technique and hand and bullock power used by the people. The slightly smaller percentage of the irrigated area in the sub-montane tracts is due to a greater dependence on water from rivers and streams. The *khadir* of the Ganges and of the other rivers does not ordinarily require irrigation. In dry seasons the streams are used if they contain water and temporary wells can be made, while a supply of water may be obtained also from old river channels and *jhils*. Irrigation water is also obtained by damming the streams at the end of the rains, the water being conducted through an indigenous system of *nullahs*. In some parts, however, the soil lies low and consists of very hard and stiff clay. Wells cannot, as a rule, be sunk here in the clay where they are most needed, and a supply in them is often very inadequate.

Wells are and will remain the major source of irrigation throughout the Gangetic alluvium and the Doab. Yet many districts show a shrinkage under well irrigation. South of the Jumna, the ground water supply is becoming more and more precarious, leading to an agricultural crisis. Other sources of supply are the *jhils* and tanks. These are chiefly used in the east of the Province, in which some 15 lakhs of the 22 lakhs so irrigated occur. With the gradual increase of pressure of population particularly manifest in the eastern districts, the fields encroach upon the marshes and swamps, while drainage schemes are also being undertaken. This has led in the first place to a diminution of the so-called "other sources of irrigation," and, secondly, to a lowering of the subsoil water level which renders well irrigation and agriculture more difficult. Molony observes:— "There is no doubt that to drain a swamp pleases the people of the locality, and it renders good land available for agriculture; but the hidden results to the agriculture dependent on the swamp for a considerable portion of its subsoil water-supply far exceed the advantages obtained by the drainage operations." The former bad state of the tract of country in the Aligarh and Muttra districts now served by the Mat Branch canal is an object lesson of the great damage that may be caused by allowing the subsoil water level to sink excessively. Had it not been possible to bring canal water to that tract, a great deal of good land served by wells would have relapsed into poor dry land with no source of irrigation.* In Muttra district the alarming fall of the water-level in the wells has been checked by the canal system, which has relieved a situation which was gradually becoming critical. In Mahaban tahsil the average water-level had receded from some 45 feet in 1877 to about 65 feet when the Mat Branch extension was opened in 1904. The level was reaching a point where the cost of masonry wells was becoming prohibitive and the digging of earthen ones impossible. The introduction of the canal into this tract has raised the average depth of the water in the wells to its old level of approximately 45 feet and averted the agricultural disaster which a further fall would have entailed.† Muttra has lost in numbers considerably within the last three decades.

The effects of the pressure of population are seen in the progress of irrigation, particularly in those districts where the normal rainfall is relatively low. On the whole, however, the percentages of net cultivated area irrigated from various sources are higher in those districts where irrigation is relatively easy on account of the high water level, and the occurrence of marshes and *jhils*. The difficulties of well construction as well as the limits of canal irrigation manifest themselves in districts of deficient and

* Molony: "Note on the level of the water in the subsoil of Gangetic plain," 1915.
† Lane: *Final Settlement Report of the Muttra District*, 1921–1925.

precarious rainfall in a disparity between the figures of the percentage of irrigated to irrigable area and of multi-cropped area and density. This is true both of well irrigated and canal irrigated districts as will appear from the following table:—

Name of district (arranged according to order of density).	Density of population per square mile.	Rural Districts.	Normal rainfall.	Percentage of irrigated to irrigable area.	Percentage of area cropped more than once to total cultivated area.	Percentage of irrigated area cropped more than once to total area cropped more than once.
Benares ...	898	704	39·99	68·2	22·8	1·3
Jaunpur ...	745	711	40·62	71·2	25·6	2·4
Gorakhpur ...	721	690	48·15	83·9	32·8	·96
Azamgarh ...	690	—	40·42	79·9	26·2	3·2
Basti	687	—	47·67	71·8	37·3	·29
Ballia	679	—	41·45	65·6	24·6	1·4
Meerut	652	545	28·09	36·8	33·4	1·3
Ghazipur ...	597	—	39·53	68·2	—	2·1
Partabgarh ...	592	—	37·90	53·7	28·0	6·1
Bulandshahr ...	560	—	26·00	49·8	31·7	15·2
Aligarh... ...	545	455	25·00	60·2	21·5	24·2
Gonda	524	—	44·55	74·4	43·6	·43
Farrukhabad ...	509	451	30·89	46·7	18·4	15·1
Cawnpore ...	485	392	31·85	44·7	9·4	16·1
Budaun... ...	484	433	32·91	10·3	20·2	·98
Hardoi	465	—	34·38	14·2	17·1	1·18
Unao	458	—	33·41	44·0	18·7	2·1
Mainpuri ...	446	—	29·70	55·9	15·6	21·1
Muttra	427	350	23·61	40·3	12·5	6·2

The above table is thus most interesting as showing the factors of agricultural productivity in relation to the density of population in different districts in the United Provinces. The amount of normal rainfall as well as facilities of irrigation show their effects on double cropping district by district. Gorakhpur has increased in density from 707 to 721. Such high density is correlated with an abundant rainfall and high percentages of irrigated and multiple cropped areas. Basti, which shows the next highest density, has also a heavy rainfall. While in Gorakhpur the average over 28 years is nearly 54 inches being still higher in the South, in Basti it varies from 40 inches on the Gogra to 70 on the frontier. The seasonal distribution varies little over the whole tract. Rainfall is seldom absent from more than one of the first four months of the year, and there is almost universal rain in May. In a good year the *hathiva* rainfall is also abundant, but this is uncertain. Thus the *rabi* is secure and easy to raise while the autumn harvest is largely a gamble. In the west, the districts of Saharanpur, Muzaffarnagar, Meerut and Bulandshahr are artificially protected by the upper and more reliable portions of the Ganges and Jumna canals, and their density of population is high and is increasing. Of these, Meerut and Bulandshahr show nearly one-third of their total cultivated area cropped more than once. Both irrigation and rainfall together govern the area cropped more than once. There also appears a close correspondence between the percentage of area cropped more than once with the

density of population. Such correspondence between high density and increase of cultivated area and multiple cropping can also be shown by taking the natural regions. The following table indicates that the figures of the percentage of cultivated to total area and of double cropped area correspond very closely to the order of density of the different divisions in the United Provinces:—

Natural Divisions.	Density.		Gross cultivated to cultivable area.		Percentage.	
					Irrigated to cultivated area.	Double-cropped to cultivable area.
	1911.	1921.	1909–10.	1919–20.		
Indo-Gangetic Plain East.	706	711	107·2	111·0	44·7	20·5 (18·4)
Sub-Himalaya East ...	586	605	118·2	122·0	28·7	29·3 (26·1)
Indo-Gangetic Plain Central.	538	528	105·5	109·0	32·1	17·7 (15·1)
Indo-Gangetic Plain West.	550	508	103·9	103·7	30·2	14·7 (13·2)
Sub-Himalaya West...	437	399	101·4	98·7	14·8	17·9 (15·4)
Central India Plateau	211	198	77·9	83·3	6·3	4·5 (23·4)

It appears from these figures that in the decade of 1911-21 there has been an increase of density as well as of the percentage of gross cultivated (i.e., the double cropped added to the net cultivated) to the cultivated area in the Eastern Sub-Himalaya and Eastern Indo-Gangetic Plain divisions, which already are the most congested. High and increasing density co-exists with great and increasing intensification of agriculture in tracts which now maintain more than double the number of persons per square mile maintained in agricultural Europe. The only exception appears to be Gonda district. Here the population fell substantially between 1891 and 1901, and there has been very slight recovery during the past two decades. The statistics also indicate that where the rainfall is defective an increased irrigation has not improved the percentage of multi-cropped area. As we have already seen, well irrigation has almost reached the limit south of the Jumna, while the Irrigation Engineers have nearly exhausted the supply of water available from perennial rivers. The high percentage of irrigated to irrigable area in Muttra and Mainpuri could have but little effect on multiple cropping and density. The same is the case in such canal districts as Aligarh, Farrukhabad and Cawnpore. Here rainfall is less, but the percentages of irrigated to irrigable area are very high. Yet the total area cropped more than once and density are relatively low. In such tracts, with an increase of population we are face to face with the operation in a large scale with the law of diminishing returns to agriculture. Some of these, moreover, have a falling water-level. The pressure of population on the soil cannot be relieved unless and until there are a rapid improvement in the arts of agriculture, a great saving in canal water by high farming and a large reduction of the labour and cost of lifting water by the adoption of power pumping for irrigation.

Let us survey the correlation between water-supply and density in greater detail. In districts where the normal rainfall falls below 30 inches per annum the deficiency outweighs all other factors in limiting agricultural productivity and density of population.

I.

Districts with less than 25 per cent. irrigated area.	Density.	Irrigation.	Rainfall.
Banda	206	5·4	37·95
Bijnor	395	6·9	43·91
Moradabad	524	7·1	38·00
Hamirpur	192	7·5	35·81
Bahraich	402	7·1	43·62
Kheri	306	10·0	43·19
Budaun...	484	10·1	32·80
Jhansi	166	10·2	34·30
Jalaun	261	12·9	39·00
Sitapur...	484	13·6	37·58
Bareilly	642·1	15·6	44·91
Mirzapur	165·8	16·0	42·55
Saharanpur	439·5	18·0	37·57
Pilibhit...	319·7	19·9	49·09
Gonda	524·4	20·2	45·26
Allahabad	491·4	20·7	37·28
Hardoi	465·0	21·1	34·66
Shahjahanpur	486·2	23·6	37·47
Bara Banki	585·5	24·2	39·00

(*N.B.*—Reverse the order according to the amount of rainfall).

II.

Rainfall over 40 inches.	Density.	Irrigation.	Rainfall.
Gorakhpur	721	28·0	48·30
Basti	687	35·1	47·99
Gonda	524	20·2	45·26
Bahraich	402	7·1	43·62
Ballia	679	28·3	41·18
Azamgarh	690	45.0	41·12
Mirzapur	165	16·0	42·55
Jaunpur	745	45·5	41·80
Sultanpur	586	35·2	41·31
Fyzabad	676	40·6	40·06
Bareilly	642	15·6	44·91
Bijnor...	395	6·9	43·91
Benares	898	31·1	39·60

III.

Districts with more than 40 per cent. of gross cultivated area which is irrigated.	Percentage of gross cultivated area which is irrigated.	Rainfall.	Density.
Mainpuri	50·6	29·84	446
Aligarh	48·1	25·08	545
Meirut	47·7	28·12	652
Muzaffarnagar	47·2	30·10	479
Jaunpur	45·5	41·08	745
Bulandshahr	45·4	25·86	560
Azamgarh	45·0	41·12	690
Etah	41·5	27·49	482
Etawah	41·3	30·82	433
Fyzabad	40·6	40·06	676

The above three tables tend to show that in districts where only one-fourth of the area is irrigated, irrigation ceases to be a factor at all in determining agricultural productivity and rural density. Irrigation, even above the limit of 40 per cent. of the gross cultivated area, fails to produce its effects upon density unless the rainfall exceeds more than 30 inches, Mainpuri, Aligarh and Bulandshahr with nearly half the cropped area irrigated have relatively low density. Their average rainfall falls below 30 inches. On the other hand, the mere amount of average rainfall exceeding a limit of 40 inches, without the aid of irrigation, fails to contribute to high density. Bijnor and Bahraich, with similar rainfall and similar irrigation development, have nearly equal density. On the other hand, districts like Benares, Ballia and Azamgarh, with less rainfall but with more irrigation, represent a much higher standard of farming and agricultural outturn and possess much greater density.

In districts where the rainfall exceeds 40 inches, rice is the dominant crop. The preponderance of rice cultivation in these districts again varies directly with the relative progress of irrigation, which is remarkable in these tracts. These districts show 70 to 80 per cent. of irrigated land to the irrigated area available. This will be evident from the following two tables:—

Percentages of rice crop to total net-cropped area.

—	1907–08.	1909–10.	1911–12.	1913–14.	1917–18.	1919–20.	1924–25.	Percentage of gross cultivated area.	Percentage increase of total net-cropped area between 1907–1924.	Per cent. irrigated to estimated irrigable area.
Gorakhpur ...	48·2	42·5	44.2	46·5	42·2	45·4	46·1	28·0	2·5	83·9
Basti... ...	52·7	47·2	48·7	48·3	50·9	48·7	53·6	35·0	7·6	79·0
Bahraich ...	32·4	23·7	26.2	28·8	37.5	30·3	39·4	7·1	6·5	60·9
Gonda ...	46·3	35·2	38·4	39·3	46·6	37·2	46·6	20·2	9·4	74·4
Benares ...	29·1	24·7	23·8	25·6	28·3	28·9	28·3	31·1	5·9	68·0
Jaunpur ...	26·4	21·9	20.6	22·9	26·2	23·3	25·3	45·5	5·6	71.2
Azamgarh ...	38·3	31·3	33·6	37·6	42·1	38·1	40·7	45·0	6·3	79·8

Percentages of wheat to total net-cropped area.

	1907–08.	1909–10.	1911–12.	1913–14.	1917–18.	1919–20.	1924–25.
Gorakhpur ...	10·9	14·6	14·5	15·8	14·8	15·1	17·2
Basti	15·3	21·8	19·4	23·1	20·3	22·2	22·2
Bahraich ...	14·6	19.1	26·1	24·7	24·5	25·3	25·5
Gonda	14·9	22·6	24·2	26·1	15·0	26·6	24·7
Benares ...	4·4	7·7	8·7	8·1	7·2	7·8	7·7
Jaunpur ...	4·9	8·1	9·9	8·8	7·2	8·6	7·7
Azamgarh ...	3·4	6·1	6·6	7·4	5·8	7·3	6·3

In spite, however, of the marvellous progress of irrigation, the fluctuations of the rainfall lead to great shrinkages of the *kharif* area throughout the Province, and are fraught with dangers particularly in the sub-montane tracts. In the eastern districts where the *rabi* crop is equally unimportant, the rainfall is less uncertain and the protection by irrigation more adequate.

In the above districts the *kharif* area is much greater than the *rabi* area, and consists of rice. Losses are relatively severe whenever the rain in insufficient or unevenly distributed, and as a rule failure of the rice cannot be compensated by a larger *rabi*, as the land cannot be tilled. In most parts of this tract early rice predominates, but in portions of Basti and Gorakhpur, where the landholders have constructed private canals, later and more valuable rices are largely grown to the general advantage of the people.

The following statement exhibits the net results of the different sowing seasons from 1908-09 following the famine year 1907-08 onwards, the normal area being taken in each case as 100:—

	1908–09.	1909–10.	1910–11.	1911–12.	1912–13.	1913–14.	1914–15.	1915–16.	1916–17.	1917–18.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	1924–25.
Kharif ...	104	101	98	80	98	95	101	102	103	100	94	101	97	99	93	96	90
Rabi	85	97	108	120	104	82	100	105	109	113	71	94	83	98	106	103	107
Zaid	121	106	104	107	110	139	172	126	129	97	141	107	117	105	102	97	103
Twice-cropped area.	74	87	105	108	91	73	98	109	116	121	64	88	68	92	95	95	94

It will be evident that out of 17 years the normal *kharif* area could not be sown for 10 years. In 1924-25 it fell short of the normal by 24 lakhs of acres or 10·5 per cent., and was the lowest during the last 12 years. In 1911-12 there was long continued drought in July and August which led to the decrease in the *kharif* area in all divisions of the Province except Gorakhpur, which had enjoyed sufficient rain for the *kharif*. The decrease was largest in the Agra division, as at present constituted, and in Bundelkhand; it was smallest in the Benares division, and in Oudh, where the sub-montane districts generally received a larger amount of rain. But the short *kharif* was compensated by an excess *rabi* area in all except a few sub-montane districts. Most of the existing canals are meant for the protection of the *rabi* crop. The protection of the rice areas, especially in the eastern districts will be subserved to some extent by the projected Sarda Canal. The scope of well irrigation, however, is almost reaching a limit in some of the rice districts where, as we have seen, the percentage of irrigated to estimated irrigable area is considerably above 70. Between 1900 and 1925 the number of masonry wells in the whole Province has gone

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up from 309,740 to 742,043 or 140 per cent. The Gorakhpur and Basti districts built 1,527 and 1,048 wells respectively during 1924-25. The agricultural security of the above districts will be measured by comparing the relative increase of the percentages of *kharif* areas with the percentages of increase of irrigated areas.

Districts.	Year.	Percentage of *kharif* to total net-cropped area.	Percentage of rice to total net-cropped area.	Percentage of the irrigated to the estimated irrigable area.	Percentage of the irrigated area to the total net-cropped area.
Gorakhpur ...	1911–12	73·7	44	68	26
	1924–25	69·5	46	83	37
Basti	1911–12	73·7	48	48	27·4
	1924–25	70·7	53	79	46·5
Bahraich ...	1911–12	68·6	26·2	54·2	5·5
	1924–25	72·7	39·4	60·9	6·5
Gonda	1911–12	73·1	38·4	33	9·7
	1924–25	74·7	46·6	74·4	25·0
Azamgarh ...	1911–12	63·5	33·6	71·8	44·2
	1924–25	64·6	40·0	79·8	53·2
Jaunpur ...	1911–12	65·5	20·6	56·7	37·7
	1924–25	67·1	25·3	71·25	52·2
Benares... ...	1911–12	59·5	23·8	91·9	28·2
	1924–25	63·0	28·3	88	29·8

All the districts north of the Ghagra are naturally protected by a heavy rainfall as well as irrigation, the high water level being responsible for facilities as regards irrigation from wells. Such security may be compared with that enjoyed by the canal districts such as Saharanpur, Muzaffarnagar, Meerut and Bulandshahr. The population of these districts has multiplied enormously within the last three decades while their agriculture is sufficiently protected by the upper and more reliable portions of the Ganges and Jumna canals.

Districts.	Year.	Net-cropped area.	Rabi area.	Percentage of rabi area to net-cropped area.	Wheat area.	Percentage of wheat area to net-cropped area.	Estimated irrigable area.	Total area irrigated.	Percentage of irrigated to estimated irrigable area.	Percentage of irrigated to total net-cropped.
Saharanpur...	1911 12	835,067	694,123	83·1	6,803	·8	252,000	92,159	36·5	11·3
	1924–25	822,835	607,343	73·8	348,483	42·3	263,000	130,703	49·7	15·8
Muzaffarnagar	1911–12	715,884	564,921	78·0	86,813	12·1	381,000	222,934	58·5	31·1
	1924–25	724,810	529,716	72·9	284,139	39·2	393,000	255,983	65·1	35·3
Meerut ...	1911–12	1,111,654	911,276	81·9	37,790	12·3	660,000	404,231	61·2	36·3
	1924 21	1,097,894	801,397	72·9	396,593	36·1	695,000	372,079	53·6	33·9
Bulandshahr	1911–12	893,852	730,038	81·7	122,916	13·7	569,000	390,660	68·6	43·7
	1924 25	885,150	621,867	70·2	220,434	24·9	575,000	286,787	49·8	32·4

It is significant that in many of the non-canal districts the percentages of irrigated to total net-cropped area are very much greater than those in the canal districts. The increase of irrigation facilities also is as a rule much greater in the non-canal districts. But the small irrigation development of some of the sub-montane districts coupled with the increasing dominance of the rice crop is a cause of anxiety in spite of higher rainfall and the *terai* conditions. Embankments to benefit the late rice should be built and the streams utilised wherever possible. In some tracts pumps on the rivers might be useful for irrigation.

The districts of Azamgarh, Jaunpur, Gorakhpur and Basti show a much larger irrigated area than the canal districts. Large areas irrigated in these districts depend upon the minor rivers as well as *jhils* and *tals* which are a fairly safe source being filled by the inflow of the rivers. These rivers offer more or less adequate protection to rice. The masonry and temporary wells with which these districts are honeycombed protect the *rabi*. These are the more important sources of irrigation and in some tracts the only source. Conditions are also exceptionally favourable for sinking masonry wells as water is near the surface and foundation clay found in most tracts.

The agricultural superiority of the non-canal to the canal districts will be evident from the following table:—

	Percentage to cultivable area of		Normal rainfall.	Percentage of increase of density of population, 1872–1921.	Percentage of increase of total net-cropped area, 1891–1924.
	Net cultivated area.	Double-cropped area.			
Non-canal districts.					
Benares	82·6	22·4	39·99	15·0	14·3
Azamgarh ...	77·3	20·1	40·42	14·8	10·2
Jaunpur	76·0	21·1	40·62	12·6	2·4
Gorakhpur ...	82·7	22·7	48·15	63·2	4·4
Basti	80·3	26·8	46·67	30·7	4·9
Canal districts.					
Meerut	82·4	18·8	28·09	17·5	1·6
Saharanpur ...	80·8	19·7	30·99	6·1	— 2·0
Muzaffarnagar ...	75·5	8·9	29·67	15·2	5·5
Bulandshahr ...	80·8	24·7	26·0	13·8	4·1

The non-canal districts mentioned above show higher percentages of net-cultivated as well as double-cropped area to total cultivable area. The former, it is true, have a more abundant and less uncertain rainfall than the western districts. But to the natural advantages of rainfall have been added the results of strenuous human effort in the direction of private irrigation from wells, *jhils, tals* and from the minor streams. We have already seen that the percentage of irrigated area in Azamgarh, Jaunpur or Basti is more than one and a half times those in districts where canal irrigation by Government has been introduced.

On the whole we expect a relatively greater agricultural progress and increase of population in the former districts than in the latter. This will be the case as a result of the efforts in the following directions:—

(1) The gradual completion of the equipment of these districts with cheap masonry wells which already exist in very large numbers and whose construction is proceeding rapidly everywhere. This will be

facilitated by *taccavi* loans as well as by the extension of co-operative organisation. Regular well surveys should be undertaken and a boring staff be maintained in each district to locate sites in doubtful localities and to pierce the foundation clay where it is too thick for country tools.

(2) The development of co-operative effort for the construction of dams, embankments and drainage works. At present the periodical floods work great havoc and their prevention must now be a matter of serious concern. Rivers, minor streams as well as drainage lines should be investigated and land reclamation and construction works under the guidance of Agricultural Engineers ought to begin on a systematic scale.

All this coupled with the natural advantage of a more abundant and even rainfall will inevitably bring about a relatively greater productivity of land and density of rural population than are expected from the development of the canal-irrigated districts.

The agricultural progress of the canal-irrigated districts lies in the following directions:—

(i) Though the canal system is extensive, there are few districts where canal exceeds well-irrigation. Moreover the canal seldom enables a full *rabi* area to be sown in years of drought when the additional water required has to come mainly from the wells. Thus there is considerable scope for assisting the construction of additional masonry and temporary wells.

(ii) Various canal tracts suffer from defective drainage and oversaturation. In some agricultural depression follows the spread of *reh* in the areas adjoining the main branches; while in others a rise in the water level occasions the falling in of non-masonry wells. The improvement of the natural channels of the minor streams and the opening out of arterial drainage lines must be undertaken on a systematic scale so that the danger to agriculture from water-logging and salt-encrustation is mitigated.

(iii) There is no doubt that over-irrigation in many regions leads not only to the waste of a vast volume of water but also to poor cultivation, and sometimes to the extension of useless alkali land which necessitates an expensive drainage system for its reclamation. The water demands of the various crops require closer investigation, and the possibilities of water saving by a combination of fodder production and improved methods of agriculture should be explored in irrigated regions. The Japanese system of adjusting the quantity of water-supply to crops and field conditions by the provision of irrigation canals with gauges for the proportional distribution of the water and the construction of discharge canals may be adopted.

(iv) As the rainfall seems to be the ultimate limiting factor in agricultural progress, a more systematic policy of afforestation and of suitable crop production in sandy tracts to prevent a further increase of arid conditions must be followed. The introduction of defensive vegetation against sand will contribute to the reclamation of new land or to the increased fertility of old. In many districts in the south-west the sandy plains are making considerable advances so that the Indian desert is extending towards the north-east. The loose sands set free by the disappearance of scrub jungle and grass with which bound them together now have resumed their march under the action of the westerly wind and already have extended a considerable distance in many districts of the United Provinces. Nothing but a chain of forest reserves can hinder further progress. Deforestation has reached the point of destroying the equilibrium between the factors determining the climate and hydrographical conditions of the tract thus imperilling its agricultural future.

QUESTION 18.—AGRICULTURAL LABOUR.—*Classes of populations and their economic conditions.*—The decline of peasant proprietorship, the prevalence of land-lordism and the growth of the landless class upon the land have profoundly affected the distribution of wealth in India. The control of land in an old agricultural country like India has largely shaped her social and political organisation. Thus the recent changes in ownership and tenancy imperceptibly modify the whole fabric of social life. The economic distribution of wealth is judged from the broad division of population into agricultural, industrial, economical, professional and other classes. A closer examination would require in the first place the differentiation of industrial workers from agricultural labourers (farm hands, etc.), and general low grade labourers of the miscellaneous and casual type who are on the margin of work and life, and secondly, the isolation of the fixed wage-earners from the rest. It is on the landless classes that the vicissitudes of the times deal their hardest blows. The following figures from one of the famine-ridden districts of the Central Provinces will tell their own tale. The figures for the labouring castes in Saugor district in successive years were as follows:—

1891	145,420
1901	109,225
1911	140,149

There was a fall of 25 per cent. during the famine decade; but in 1911, the aggregate was within 4 per cent. of the figures of 1891. Many who migrated doubtless returned; and with increasing prosperity the birth rate became prolific. Again, famines cut out half a generation, but children born since 1900 reached the working age.

The professions representing more or less the affluent section of the community form a microscopic minority in India. The fixed wage earners also form a very small section. The unskilled labourers are now seen to increase decade after decade. The following table shows their number in 1911 and 1921:—

—	1911.	1921.	Variation per cent.
Farm servants and field labourers.	41,246,335	37,924,917	— 8·1
Labourers and workmen unspecified.	8,273,650	9,300,105	+ 12·4

Part-time hired labour.—Hired labourers in India, unlike those on the farms of North and North-West Europe, are not whole-time professional labourers but part-time day-labourers. They usually own a little land themselves, and would like more but there is also a growing class of landless labourers whose employment is uncertain, and who shift from fields to mines and from mines to plantations.

Decline in cultivating landowners and field labourers.—Every circumstance which has weakened the economic position of the small holder has increased the supply of agricultural labourers—the loss of common rights in the rural economy, the disuse of collective enterprise, the sub-division of holdings, the increase of the class of rent receivers, free-mortgaging and transfer of land and the decline of cottage industries. The growth of population in this century has been so great and the holdings have so much been reduced in size that they have often become uneconomical compelling the peasants to supplement the proceeds of their holdings by outside work, or to sell their lands to middle-men or to more prosperous peasants.

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It is noteworthy that the populations on the margin of life engaged in occupations that entail heavy physical but little mental energy are endowed with larger families than the higher and the more intellectual sections of society. In a normal decade with no epidemics or other disturbing factors, such sections of the community may be expected to increase faster than the rest. The last two decades have been unusual, and the mortality which is always the heaviest from these lower orders has been particularly heavy. Mr. S. V. Mukerjee who, in his Census Report, discusses this question shows that the number of field labourers in Baroda has been progressively decreasing since 1901; but on the other hand, the number of cultivators and receivers of rent from agricultural land (with their dependents) has progressively increased (from 970,675 in 1911 to 1,058,182 in 1921). The Punjab Census Report similarly records an increase of the number of persons living on income from rent of agricultural lands from 626,000 in 1911, to 1,008,000 in 1921. On the other hand, the number of farm servants and field labourers has actually decreased from 1,192,000 in 1911, to 1,134,000 in 1921. In Madras there is a similar tendency throughout the last twenty years for cultivating landowners and labourers to lose ground to the cultivating tenant and the non-cultivating rent-receiver or rent payer. For every thousand of workers (i.e., excluding dependents) the non-cultivating classes number 77 in 1921; they numbered 20 in 1901. The agricultural classes are classified as follows in the Madras Presidency.*

—	1901.	1911.	1921.
Non-cultivating landowners	19	23	49
Non-cultivating tenants	1	4	28
Cultivating landowners	484	426	381
Cultivating tenants	151	207	225
Farm servants and field labourers ...	345	340	317

"Does this imply," asks the Census Superintendent, "that the man who farms his own lands is being forced to relinquish it to the non-cultivating money-lender from whom he will cultivate as a tenant."? In the United Provinces, the number of ordinary cultivators has increased from 28,712,015 to 29,843,168. On the other hand, the number of farm servants and field labourers has decreased from 4,552,043 in 1911 to 4,035,887 in 1921, the decrease being 11·3 per cent. In Bihar and Orissa rent payers or ordinary agriculturists have increased by 9 per cent. while farm servants and field labourers have declined by 22 per cent. In Bengal also the number of ordinary cultivators including dependents has increased from 29,748,666 to 30,543,557, and the number of farm servants and field labourers has diminished from 3,660,000 to 1,805,502, the decrease being 50 per cent. In the Central Provinces and Berar ordinary cultivators have decreased by 161,000 or 2 per cent., while rent receivers have increased by 52 per cent. or 67,000 persons. This has been due to the increase of the practice of sub-letting. On the other hand, farm servants have declined by 23 per cent. The following statement of the economic position of the different classes in Balaghat shows the same tendency as prevails in other districts. The number of rent-receivers and cultivators increased from 173,655 to 205,753 in the period 1891 to 1901, but the number of farm-hands actually decreased from 52,264 to 44,802, a reduction by 15 per cent. approximately, while the number of field labourers showed but very slight increase 48,500 to 51,470. Many of the farm hands took to cultivation without altogether giving up their former occupation of working in the mines and irrigation works, or carting mineral and forest produce. It is doubtful

* Pillai: *Economic Conditions in India*, p. 114.

whether this increase in the number of cultivating owners and tenants is an unmixed good. Where the agricultural labourer as a result of the rise in prosperity sets up as a peasant proprietor, we may hope he turns his land and his own life to good account with the magic of property around him. But he is mostly without staying power and his holding is more often than not too small to be economic.

Driving the hired labourer off the land.—By a selective process, the superior cultivator is driving the more thriftless of his brethren to the marginal areas. Thus the extension of cultivation results, if at all, in a gradually diminishing return to an increasing amount of labour and expense. It is noteworthy that the figures of the transfer of land by agriculturists to non-agriculturists show that the tendency of the latter to take possession of the agriculturist's land is to a certain extent increasing synchronously with the tendency to rent the land rather than cultivate through hired labour. In Bengal ordinary cultivators number 9,274,927 workers, and the farm servants and field labourers number 1,805,502. There is thus only one hired labourer on the land to every five who cultivate land of their own. In Dacca and Chittagong Divisions, there is only one hired labourer to eight ordinary cultivators. In the United Provinces there are 16,092,000 cultivators (workers) while the farmers and field labourers total 4,035,887. Here there is only one hired labourer to every four cultivators (workers). In the Central Provinces and Berar, 47 per cent. of the population are cultivators, and 27 per cent. farm servants or labourers, i.e., there is approximately one hired labourer to two cultivators. In England and Wales there are by contrast well over three hired labourers to every farmer. It may be said generally that the holdings in the United Provinces, Bihar and Bengal are so small that the cultivation of them is hardly ever too much for their owners themselves to accomplish unaided. And, in fact, the greater the pressure of the agricultural population on the soil and the more uneconomical in size the holding becomes as a result of minute sub-division, the less will be the tendency to employ hired labourers in the fields, who will have to seek employment in the rural tracts as earth-workers and road menders or migrate to industrial towns and plantations. This explains the large increase of the class of unspecified workmen in the last census decade. The more efficient of them may accordingly be called professional labourers (*majdur*) as distinguished from field labourers. The professional labourers work on roads and railways, in harbours and dock yards; they are employed for canal cutting and building construction, for the lower strata of domestic service and for all the work which demands either a little more intelligence or more strenuous exertion than the work done by a field labourer.

Conditions of the field labourer.—Somewhat superior in economic status are those field labourers who possess small plots of land of their own, or they work as partners, receiving half the crop for cultivating another man's plot, the principal paying the rent and supplying the seed grain. If no seed grain is supplied, half the reaping expenses must be given by the principal if he wants to have a moiety. If neither seed nor reaping expenses are given, the shares are two-fifths to the principal and three-fifths to the cultivator. Sometimes the peasant acquires the right to cultivate another's plot by offering paddy loans, and the shares are governed by local economic conditions. It is because their own holdings do not suffice for their maintenance that they are hired out. Sometimes, again, they do not possess any holdings at all either of their own or on share basis, and are permanently attached to a cultivator's family or move from plot to plot. In the former case, they are furnished with a small wretched cottage in the midst of the farms which they till. The field labourers are often paid in kind for their services. They receive a share in the crop, together with other dues which are fixed by custom. This custom varies from Province to Province. Again, the share of the farm hands differs according to

harvest conditions. Usually the share of the harvest allotted to the farm hand is standardised by a bundle tied by three lengths of straw. As the straw length increases or decreases with a good or bad harvest, there is an automatic adjustment of wages. When the harvest is abundant, the field labourer enjoys plenty. The Chamars in the United Provinces, who supply agricultural labour and help the cultivators in ploughing, sowing and reaping, and also repairing the cottages, get one-thirteenth part of the produce of barley and one-sixteenth part of wheat. The Ahirs, who sometimes supply agricultural labour, obtain the same remuneration as the Chamars. They are often tied to the same plot of land for generations. In the Punjab, the Chamar, if he is a *separ* (permanent *kamin*) receives one-tenth of the whole crop of grain for the general help rendered by him. The Chamars remove dead cattle, give two pair of boots a year for the ploughman, and two for the woman who brings the bread into the fields, and one ox whip (*narka*), and a leather rope (*santa*) to fix the yoke (*jua*) to the plough in the half-year, and do all the necessary repair. Besides their function as artisans, the Chamars perform a very considerable part of agricultural labour. They clear the fields before ploughing and assist the reaping of the harvest. They also plaster the houses with mud when needed and do all kinds of odd work. The status of the field labourers has been governed by ethnic and social history, the agricultural conditions and population of the village in different Provinces from time immemorial. In Bengal reapers are paid in kind at the rate of their being allowed to take one bundle to every ten bundles they cut. Kind wages for agricultural labourers who are on a yearly contract are 8 to 10 maunds of rice a year, two pairs of cloths and two napkins, together with other small requisites; when new hands are hired they get as much as 5 to 6 annas per diem. In many villages, along with paddy or husked rice, tobacco, *jalpan* (tiffin), oil for bathing and even a meal is given. In the south-western districts the rate is 4 to 5 annas per 15 *gandas* or 16 sheaves; any additional work is paid according to the same proportion. For the pulse and *rabi* crops the rates are less. Sometimes the reapers make a contract of reaping an acre at the rate of so many bundles. Since the price of food grains is rising enormously, the landholder is now substituting payment in cash for payment in grains. This is growing common. The Wage Census of Bengal, 1916, shows that the rates are generally much higher in East and North Bengal than in West Bengal. Taking the wages of unskilled labour as a standard of comparison, we find the highest median rate obtains in Faridpur district (9 annas) and the lowest in Murshidabad district (4½ annas). In the Bombay Presidency real wages are now about 5 seers of *jowar*, while cash wages are 8 or 10 annas a day in the more prosperous districts. In the Western Punjab Rs.5 a month, with a blanket and a pair of shoes at the end of the year, are what a day labourer expects. In the colonies, he gets twice that amount, and food and clothing as well; and if he is sufficiently skilled to work in a garden, he may get as much as Rs.18 or Rs.20 a month. Hours of labour, too, are less exacting, and better work is done in consequence.* Cash wages in the Punjab are 6 and 7 annas a day, and in the United Provinces 4 to 6 annas. In a recent enquiry in the Bombay Presidency, it was found that in 990 villages in which enquiries were made, cash wages without supplement were familiar in 233 villages, and grain wages were familiar in 376 villages. In some of the villages more than one method of payment was in vogue. It is unjust that the landholders should sell away the grains and force these field labourers to purchase the same from the petty shopkeepers at a higher price. The one way of escape for the *padial* from this condition of servitude and poverty is emigration.† But the prospects there are not very attractive. In

* Darling: *The Punjab Peasant*, page 159.
† Slater: *South Indian Villages.*

Ceylon and other plantations the labourers get only 5 annas. A woman labourer in plantations gets only 3 annas.

Wages and the price of rice. It would be interesting to chart the movement of wages (in annas) in the rural areas in Bengal* during the past 80 years:—

——	*1842.*	*1852.*	*1862.*	*1872.*	*1911.*	*1922.*
Field labourer without food.	1	1½	2	3	4	4 to 6
Carpenters	2	3	4	6 to 8	7 to 10½	8 to 12
Ghorami, house makers...	2	3	4	5	6	6
Prices of rice (seers per Re.)	—	—	27·07	22·74	—	5·0

Nominal and real wages.—Economists draw a distinction between nominal and real wages. By nominal or money wages is meant the actual cash which a man earns for a period of time. By real wages is meant the amount of commodities which a man can buy with his money wages. In making comparisons between the economic conditions of different periods, in districts or regions, real wages must be taken. Mr. K. L. Datta, in his *Report on the Enquiry into the Rise of Prices in India*, selected the period from 1890 to 1894 as his basic or standard period for the purpose of estimating the fluctuations in price levels. In reviewing rises in wages in subsequent years, he observes that in rural areas in India, wages of agricultural labourers and village artisans have risen enormously as measured by their purchasing power. About 1912 they were about 38 per cent. above the level of the standard period. The rise in the wages of industrial labour had not been so large. Nominal wages had increased in every case, but the rise was not in all cases as great as the rise in prices. The nominal wages of agricultural labour rose from 105 in 1895 to 189 in 1912; and real wages from 103 to 138 during the same period. It ought to be pointed out here that these wage figures make no allowance of the fact that agricultural labour cannot be continuously employed throughout the year. There are, as we have seen, idle as well as busy agricultural seasons, and wages received during busy seasons do not represent remuneration throughout the year. The following would represent a comparative statement showing nominal and real wages of rural agricultural labourers and labourers in tea gardens in Assam.

The index numbers are given relatives to an index number of 100 for the period from 1890 to 1894:—

——	Nominal Wages.						Real Wages.				
	1890–1894.	1895.	1900.	1905.	1910.	1912.	1895–1899.	1900–1904.	1905–1909.	1910.	1912.
1. Agricultural labourers.	100	105	125	147	170	189	103	120	123	134	138
2. Tea Garden labourers.	100	106	103	106	117	120	101	96	90	98	95

* *Second Wage Census of Bengal*, April, 1911.

Dr. Radhakamal Mukherjee.

Thus the coolies in tea gardens appear to be in the worst position, as their real wages have fallen 5 per cent. below those in the basic period, though they get some concessions of a limited character, such as land for cultivation and in some cases rice at a lower rate than the market rate.

Rise in wages is less than rise in prices.—The Committee appointed to enquire into labour conditions in Assam found that the percentage of the rise in family earnings in the case of tea-garden labourers for the whole Province in 1922, as compared with 1914, is 19·2. On the other hand, the price of the necessaries of life rose in the same period by 39 per cent. 139·95 represents the approximate difference in the cost of living of the garden coolie in 1922 as compared with 1914.

The items of expenditure of a labourer's family are tabulated in what are family budgets. As a rule, a tea-garden coolie brings his family with him to the garden. In industries like the jute mills and coal mines the labourer frequently leaves his family in his native village and remits money to them, or returns home after some months with his savings. It is estimated that the average coolie family consists of one working woman, about three-tenths of a working child, about one non-working child and two-tenths of an adult non-working dependent. Thus the subsidiary occupations of the man, particularly rice cultivation, and the household duties of the woman are responsible for a considerable percentage of the absentees in the daily muster roll. Adopting the standard of an average working family as consisting of one working man, one working woman and three-tenths of a working child, the rise of earnings has not kept pace with the increase in the family budgets. In other words, the rise in real wages is appreciably less than the rise in nominal wages. The purchasing power of the present level of wages is less than in 1914. The Report of the Board of Revenue of the United Provinces for 1921 states: "The demand for labour was again in excess of the supply, and wages rose in consequence proportionately to the increase in the cost of living, so that labourers did not suffer." The Assam Labour Enquiry Committee remarked: "It can hardly be a matter of surprise if, under these favourable conditions, labourers from the United Provinces should regard the attractions offered on many estates in Assam as insufficient and should hesitate to leave their home districts." In the estates themselves, the coolie's standard of living has been lowered of late years. In the Bombay Presidency, the wages of field labourers in the rural areas have increased in the following manner*:— 1900, 2 annas 6 pies; 1913, 4 annas 3 pies; 1922, 7 annas 3 pies. But real wages have slightly fallen:—

——	1900.	1914.	1921.	1922.
Nominal wages	100	180	270	290
Real wages	—	154	138	145

The real wages were based on the prices of six chief important food grains in the Bombay Presidency, year by year, between 1900 and 1922.

Agrarian serfdom in India.—But in the lowest rung of the economic ladder in India stand those permanent agricultural labourers who rarely receive cash and whose conditions vary from absolute to mitigated slavery. Such is the custom of the country in many parts of India that the zamindars, *malguzars*, or ordinary cultivator nearly always contributes to get his servant into his debt, and thus obtain a powerful hold over him

* *Report on an Enquiry into Agricultural Wages in the Bombay Presidency*, page 23.

which extends even to his posterity. Agrarian serfdom is more discernible in those parts of India where the number of the lower and depressed orders is the largest. Bombay, Madras, Malabar, Cochin, the Central Provinces, Berar and Chota Nagpur show the largest aboriginal population, and it is in these areas that the status of the agricultural labourer verges on slavery. The ethnic composition of the village, which governs the social stratification, is thus responsible for the survival of slavery.

In the Bombay Presidency there are the Dublas and Kolis, who are bound slaves to a greater or smaller extent. Most of their families are serving from several generations practically as slaves to their masters' household. They receive money in advance for their marriage, and orally bind themselves to serve till they pay off their debt. They are fed and clothed by their masters. The first agreement may be for a term of years, but this term usually leads up to another, and that to a third, till in the end all hope of redeeming the advance is gone. Annual farm hands get Rs.200 to Rs.250, and in addition 4 *kuros* of *juar* every month in Amraoti. In Berar such permanent farm hands engaged by the year are called *shalkaris* or *baramasis*. Often they have fallen into hereditary dependence on the malguzar or cultivator. They are paid 5 to 6 *kuros* per month (1 *kuro* equals approximately 20 lbs.), usually in *juar*, and in addition Rs.25 to Rs.40 in cash and a blanket and a pair of shoes per year. In one district he is paid 2½ *kuros* per week, either in rice or *juar*, and in addition Rs.60 per year and a pair of shoes and cloths. In a village in Berar, I found that there are 100 *salkaris* for 700 families of the village; they get annually Rs.180 to 200. They work for a year, and get an advance of Rs.200 before their engagement.

Padialism, or debt slavery in Madras.—In the south-west of Madras there are the Ezhuvas, the Cherumas, the Pulaiyas and the Holiyas who are virtually slaves. In the east coast the hold on the land of the Brahmins is strongest and a large portion of the agricultural labourers are Pariahs who are often *padials*. The *padial* is a sort of serf, who has fallen into hereditary dependence on a landowner by debt. In almost every case the original debt was a sum of money borrowed by a landless man to solemnize his marriage or, more frequently, that of a son or daughter, the borrower undertaking to work for the lender until the debt should be repaid, in return for a certain limited supply of food. Quite recently a lad of 18 borrowed Rs.25 in cash and grain to celebrate his wedding with due festivity and became a *padial*. Such a loan is never repaid, but descends from one generation to another and the *padials* themselves are transferred with the creditor's land when he sells it or dies. If the *padial* transfers his services to another master, the amount will be returned by the latter. If he runs away, the owner loses the amount. His wages are generally paid in kind. The usual kind wages are 30 Madras measures of paddy per month per head. At present prices 30 Madras measures of paddy are worth about Rs.3-12-0 (5s.). A Madras measure of paddy weighs 2½ lbs. but when husked loses about half its volume and one-third of its weight. The *padial's* paddy allowance therefore works out at about 27 oz. of raw rice per day; a quantity that the man is probably able and willing to eat himself without assistance from his wife and family. But sometimes he gets less. Thus in one village he gets 22 Madras measures of paddy per month, a daily meal of *ragi* porridge, and annually two cloths and 18 measures of paddy or some other grain. In some villages he gets in addition a small plot of land, say, a quarter of an acre to cultivate for himself. The family of the *padial* must help the patron when required, but then extra payment is made. In Bengal the labourer works from 6.30 to 12 a.m. After one and a half hours' recess for food he continues from 1.30 or 2 p.m. till 6.30 p.m. In Orissa he begins work at

6 a.m. and continues till 11.30 or 12 a.m. Then he goes home for food and rest, returns at 3 p.m. and works till evening. In Orissa hired agricultural labourers, called *muliyas* or *nit majurs*, are of three kinds. (1) The *chakar* or *baramasiya* labourer who is engaged for twelve months. He receives both board and lodging and is paid Rs.24 in two instalments. Usually his ancestor has obtained a loan which descends from generation to generation and from which there is no escape. (2) The *naga muliya* or *haria muliya*, who works under an agreement as a yearly servant like the former but does not receive his board and lodging at his master's house. He receives a *gauni* or 4 seers of paddy and in addition is allowed a plot of land to cultivate free of rent called *betabasi*. (3) The *danda muliya* who enters into a contract with his employer and engages himself for a short period at specified rates of wages. All wealthy Brahmin villages contain a large proportion of *nagi muliyas*. In smaller and poorer villages the *danda* and *uparai muliyas* are more usual. The condition of these labourers is very unsatisfactory. Before the harvest when stocks are low, they seldom get the bare minimum of subsistence while they are a little better off during the harvest season. Similar classes of hired labourers are met with in Midnapore. The *danda muliya* here gets 5 annas per 15 *gandas* of sheaves reaped. He enters into an agreement called *kuta*, to plough or harvest the fields. The *kuthia* is given 18 *gunts* of land. From Chait to Bhadia he gets 15 *kathas* of paddy and from Ashwani to Falgun 6 *kathas*. He also gets one *chaddar* a year.

Kamia System of debt bondage in Bihar.—Worse than all the former classes of serfs are the *kamias* of Bihar, bond servants of their masters, who in return for a loan received likewise bind themselves to perform whatever menial services required of them in lieu of the interest due to the loan. Mr. Sifton in his Hazaribagh Settlement Report describes the *kamiauti* (agricultural slavery) thus: "In the first place the *kamia* cannot bargain about his wages, he must accept the wage that is customary for landlords to give to his class, which is 2½ seers (*katcha*) of unhusked paddy yielding about ¾ seer of rice or its equivalent in some other grain; the wages are invariably paid in grain and not in cash, and represent only one-third of a day's wages for free labour paid for example by a contractor for road repair work. If the *kamia's* wife also works for his master, she receives a slightly smaller remuneration; and their joint wages are not sufficient to feed properly themselves and the normal family of children which they are certain to possess. Secondly, the *kamia* never sees any money, unless it be the occasional few pice he may earn as a *palki* bearer in his spare time, which he naturally spends on drink. Consequently he has no chance of ever repaying the principal of his debt and becoming a free man again. A *kamiauti* bond therefore involves a life sentence. Thirdly, the condition becomes hereditary. Although the son is not responsible for his father's debt after his death, a new debt is always contracted on behalf of the son on the occasion of his marriage which renders him also a *kamia* for life. Fourthly, daily work is not guaranteed by the master, and no food is supplied on the days when there is no work to be done. The result is thus that the master takes the *kamia's* labour at a sweated wage for most of the year, but at a time when there is no agricultural work to be done and the *kamia* has least chance of getting any daily employment elsewhere, he is left to shift for himself as best as he can. He is then free to get work wherever he can, but cannot leave his village for any time in search of it for fear that he might abscond. Actually he is reduced to earning the most miserable subsistence by collecting fuel and grass for sale."

The restriction of his movements renders the *kamia* nothing better than a Negro slave. An absconding *kamia* is unable to find an asylum anywhere

in any part of the area where the system is prevalent. The landlords as a class combine to maintain the system and return to his master any *kamia* taking shelter in their villages; and in the past the police have helped, unofficially, to track down and recover runaways. On his return the *kamia* is bullied and ill-treated and, having no money at all, he is unable to appeal to the courts for redress or protection. The sale and purchase of *kamias* is by no means uncommon in the north-west of the district. The price is the amount of the *kamia's* debt. It is probably understood that a higher price would be an offence under the laws concerning slavery and the transaction is therefore formally represented as the taking over of the debt. Various customs attach to the *kamia's* action of running away in different districts in Behar. In some villages the first ryot who, seeing that he is a runaway, gives him a meal has the right to him. In other cases, he takes an advance from any one who will give it and execute a bond. If the former master finds out where he is, he can come and reclaim him on payment of any advance which the new master may have made. Sometimes the old master sells off the *kamia* on receipt of the advance given to the latter from a new master. The system is to-day very much alive in most districts in Bihar, and still extending in some. Like the *padial* and the *pulaiya* in Madras, and the *chakar* system in Orissa or the *shalakari* in the Central Provinces, the *kamiauti* can be abolished only by special legislation, making it penal to keep a bond slave and extinguishing all his debts. As a temporary measure, when such legislation is enforced, it would be necessary for Government to open out new lands by reclamation and constitute them into small holdings for the discharged serfs, as well as to provide special facilities for emigration to labour districts. In this way, the surplus serf labour would be drafted off; and their former employees be forced either to settle the agricultural labourers on rent in their lands or to pay them a free-labour wage. In the case of the extension of cultivation, the principle that the Government usually follows is to offer the tenancy of land, hitherto uncultivated, in the first instance to the holder of adjoining cultivated land, and if he declines it to other landholder, so that the landless labourers get no chance unless all the peasants refuse it.

In Bengal the hours of work for the field labourers are from 6 a.m. to 1.30 p.m. and, again, from 3.30 to 6 p.m. In Madras field labourers are sometimes required to work with two intervals from 4.30 a.m. to 6 p.m.; but the regular hours of labour are 6 a.m. to 6 p.m. In the Bombay Presidency, men engaged for one year work from 7 a.m. to 6 p.m. Before the War they worked for 12 hours, while 10 years ago they worked from 5 a.m. to 9 p.m., including outdoor work. In the Central Provinces the hours are from 4 to 11 a.m., followed by afternoon work for cattle. In the rains the regular hours are from 7 a.m. to 6 p.m. In most parts of India there is usually a recess of one or two hours in midday for food. Everywhere the hours are adjusted to summer and winter conditions. Sometimes the agricultural labourer is required to work 24 hours a day, including night watch. In Bengal he gets a remuneration of Re.1 per mensem for guarding the crops at night. A field labourer in Salem district gets a maximum pay of Rs.45 a year in advance, and has to work in the field or in the landlord's house the whole day and night.

Vanishing of the field labourer.—On the one hand, the development of industry and commerce has caused a greater demand for labour in every Province, and, on the other, plague, influenza and malaria have reduced the population. In the villages the more substantial cultivators, such as the Jotdars of Bengal, the Patidars in Gujrat, the Lingayats of Bombay and the superior peasant proprietors of the Punjab, now take a less active part in field operations than before and employ farm hands

On the other hand, in the case of the less substantial cultivators whose holdings are small, the economic conditions discourage the employment of inefficient semi-slave or hired labour, while the rise of prices increases the cost of maintaining it on the land. Thus, in many Provinces, there is an exodus of agricultural labour from the holdings of cultivating landowners. In most parts of India there is very little of culturable land left unoccupied, the best cultivators will not usually care for it, and, as each additional area is leased for cultivation, there being less and less demand for agriculturists, more and more of these landless labourers drift in to take it up, others drift to the mines, factories or plantations in the country or go abroad. Long period contracts are thus gradually superseded and the field labourers, instead of serving the same master from generation to generation, prefer to work for daily wages or on the piecework system. Sometimes they receive payment partly in cash and partly in kind. Dues of this sort are elastic, they depend on local conditions and necessities. But the long-time service of the past, which is a kind of semi-slavery, still persists. It is found even in the Bombay Presidency in Khandesh and Gujrat, where the recent industrialisation has contributed more than any other Province to emancipation of farm hands.

Agriculture in transition. Plight of the derelict farm hand.—In some parts of India, however, agricultural labour is starving, and agriculturists feel bitterly their want for the field labour and apprehend a fall in the value of land in consequence of a demand for the same. In the Madras Presidency it is usual to find *padials* bound hand and foot to the *mirasdars* for generations. At the same time the immigration to Burma, Ceylon or the Straits from the East Coast has long been a source of depression of agricultural labour, and the most substantial cultivators complain that the farm hands are now more difficult to secure and work less efficiently, though they draw double the wages. Thus, in the same Province, the agricultural labour conditions are found to be strikingly disparate in different parts and in different seasons.

Conditions of rainfall and irrigation, ploughing and the rotation of crops, as well as the size of the holding of the cultivator's family, govern the demand and supply for rural labour. It is usually in the cultivating and harvesting seasons that the demand for and price of agricultural labour rise. The distinction in the Census Report between undefined and agricultural labourers is thus not a hard-and-fast one, and there is periodical transfer from one group to another.* The mills, shops and houses of the largest cities and the mines and plantations all draw upon the rural population. Where the available labour supply is largely at the disposal of the local mines and factories, the rates of agricultural wages are higher. On the other hand, where the local landlords command the agricultural labour supply, labourers are more difficult to obtain for industrial purposes. The activities of recruiting agents and the hopes they offer and the deception they practise also play not a negligible part in governing the rural exodus. There is no organization on the part of the agricultural workers. There are no agricultural labour unions which might deal with the *sardars* or middlemen collectively, stipulate about wages and the terms of contract, and guide the flow of labour to places where there is greater effective demand. The conservative habits of the population check the mobility of labour. Where there is no desire for a higher standard of living, the rural labourers are satisfied with the old conditions of employment. The cottage and land industries in which such labourers engage themselves throughout the year also tie them to their villages. This applies particularly to the women. Throughout India the women

* *Census Report of Bihar and Orissa*, 1921.

and children are employed as carriers. If they are working at any distance from their homes, or if they have no homes, they generally come with the male member of the family, but they often come independently when they are working close to their homes and can return for the nights. Their wages are the lowest. In Bihar, and also in Orissa, the daily wage of a man varies from 4 to 8 annas, while that of a woman from 2 to 6 annas, and that of a child from 2 to 5 or 6 annas, according to size and sex. Similarly, in the Madras Presidency the wage of casual agricultural labour varies from 5 to 8 annas a day for a man and that for a woman from 3 to 4 annas only.* Mann estimated that the cost of living of a labourer's family, consisting of himself, his wife and two children, was Rs.34.65 per month. His estimate was based on a study of villages in the Deccan in 1918. On this basis, the wages shown above are absolutely inadequate. The more substantial labourers use their bullocks and carts to ply for hire from the village to the nearest cities during the off season when they are not required for ordinary purposes. Carting on the roads, poultry keeping, rope making, basket work, cocoon rearing are also common bye-occupations of the more substantial field labourers, but the large majority of them are extremely poor and miserable. They are clad in rags and found to live in wretched, insufficient cottages along with the livestock of the farm. I have found men, women and children sharing the same thatched hut with buffaloes. A serf the labourer is, and in ninety-nine cases out of a hundred a serf he must remain. With him the temptation of higher wages in another village or the opportuniy for a job in a neighbouring rice mill does not count. Plague, malaria and influenza work their havoc on the population, and most on this class. The diminution of supply increases the demand for labour, but his condition remains unaltered. Above all, the precariousness and uncertainty of Indian rainfall, with which economic conditions are so closely and intimately related, are writ large on his forehead, betokening the small comfort of a single meal, thin gruel and loin cloth in a prosperous year, and starvation and death in a year of scarcity. Such is the condition of the hired farm hand in India, who is so often lost sight of—that toiling, unorganised, unstriking but all-important factor in the machinery of Indian rural life.

A supplementary note on the general land situation in India.

As in all agricultural countries, so in India, the land problem is the most significant of national questions. The standard of living of the Indian peasant cannot rise unless a change in the land system supplies the essential economic basis of more efficient peasant-farming. Neither scientific agriculture nor co-operation can make much headway unless we reform the land system, now so serious a drawback to the prosperity of the small farmers. In many parts of India, the peasant is unable under existing land settlement to make his occupation profitable. Indebtedness weighs him down to an extent difficult for him to remedy at prevailing rates of interest with his average-sized holding and his uncertain tenure, while the high figures of transfer of holdings to the non-agricultural classes indicate a difficult situation. The inefficient system of agriculture that prevails, indeed, is connected less with tillage practice than with the forms of tenure now overshadowing the ancient peasant proprietorship which formerly enjoyed the protection of the village communities. Both small ownership and the growth of village communities in India are connected with the dense population and with the practice of rice agriculture, which necessitates the breaking-up of land into small plots surrounded by dykes and channels, and the collective management of irrigation. The break-up of the village communities everywhere has spelled agricultural decline. The disuse of equitable regulations as regards meadows, pasture-grounds, tanks and irrigation channels or the

* *Madras Census Report*, 1921.

supply of free labour for common agricultural tasks which formerly was facilitated by the communal life lived in the village communities has brought a weakness to the rural economy, which neither new habits inculcated by education nor the measures of Government can cure. But peasant proprietorship has been weakened not merely by the loss of the traditions of social and agricultural co-operation; it also has been working its own decay by minute fragmentation when there exists no check of a collective co-parcenary community. The creation of landed estates in India has led also to the minimum amount of agricultural utilisation, as in England. With the increase of population and the importation of the English notions of property, the landlord has increased his rents more and more, and also imposed various kinds of illegal cesses and dues, without, however, interesting himself in matters of land improvement. Tenancy legislation has been necessary where tenants have been regarded merely as money investments and permanent improvements have been discouraged, but the economic strength of tenants is by no means assured; while in some parts rack-renting and other dangers of sub-infeudation and sub-letting through a chain of inferior proprietors, are realised. The creation of landlordism, both of superior and inferior grades, and the break-up of peasant proprietorship and the village system in India, have been the result of misunderstanding on the part of early British administrators who derived their lessons mainly from the agricultural history of Western Europe. In the East the village communal system was an old and essential adjustment, suitable to the requirements of dense populations in fertile plains. Thus the land and village systems and forms of tenure are far different in India and Europe.

Small holdings and zamindari estates. In tracing the stages of agricultural development, one should sift the factors which govern the evolution of different types of land-holding and village life in India and the medieval West. An earlier clan and tribal organisation here evolves into the village communal system. The bond of union is no longer kinship but the newly-developed emphasis on co-operative methods in irrigation and the social necessities of a compactly congregated population. This differentiates the Indian village community from the Teutonic or the Slavonic institution. The latter smacks too much of its early tribal, communal origins; while the former has differentiated economic structures, classes and castes and exhibits more elaborate customs and usages governing the diverse interests in the soil than could have been evolved by organisations on a mere ethnic basis. These are quite compatible with intensive cultivation and peasant ownership, though the communal element persistently prevailed. In the West agricultural development was possible only when village collectivism, with its communal routine of agriculture, which was far more rigid than in India, was superseded either by the *latifundia* or by unrestricted small-holding. Here the village communities established a balance between individual and collective rights which was conducive to agricultural efficiency in the adaptation to geographical and social conditions. But the economics of conquest has left its deep marks on Indian as well as European rural life. The influence of political authority and conquest in establishing the feudal as distinguished from the autonomous type of village organisation is discernible in both East and West. Thus the growth of manorial estates has been seen both in Europe and in India and deserves a comparative investigation. Small farming declined as the result both of the suppression of village communities and the rise of a class of superior and inferior rent-receivers who neglected their task and delegated the mere function of collecting their share of the produce to agents or contractors. In other countries, similar causes have produced a similar transformation of the relations of the agrarian population, with its reactions upon agriculture.

Position of the Indian peasant—Signs of unrest.—The agricultural population of India now works on very meagre resources, and these resources

are distributed very poorly, from the point of view of the well-being of the peasants themselves. Our examination of the changes in landownership and tenantry during the last fifty years shows that this mal-distribution is growing worse. The economic position of the small-holder has deteriorated, while the contrasts between landlords and expropriated peasants, between the increasing class of rent-receivers and the toiling agricultural serfs, predict a crisis in our agricultural history. The uneconomic holding, the absence of full proprietorship of the cultivators and semi-slave hired labour, are incompatible with efficient intensive cultivation, which is the great advantage of peasant farming, and without which our increasing population must remain contented with a single meal, thin gruel and a loin-cloth. The dim rumblings of peasant class-consciousness already audible in some parts of India, challenge the present agricultural regime. No man should suffer imprisonment with hard labour on one-eighth of an acre of land. No class should be merely "a mud-hill on which a superstructure may rest"; the class which maintains the race should not be singled out to bear its burdens and penalties.

Tenant Law and its abuse.—There cannot be any doubt that with the rise of landlordism the rights of the village communities and peasant proprietors have been suppressed. The aim of tenancy legislation in Bengal, the United and the Central Provinces has been to correct the mistake of such suppression and to re-create proprietorship, albeit in a modified form. Occupancy right has been bestowed, but the classification of tenants into occupancy and non-occupancy nowhere has been a sufficient protection against enhancement of rents or eviction. The great mistake of tenancy reform has been that the right it created depended upon a time-limit and therefore on the forbearance of the superior proprietor to exercise his power of eviction before it matured. Here the right came to be sold and purchased and the superior proprietor, and sometimes the surrendering tenant as well, took advantage of the situation and extorted some profits from the transaction. This is the case still in Bengal, Bihar and the United Provinces, where the increase of population and competition for holdings have aggravated the evil. The system of taking premiums from the tenants has less hold in Bengal and Bihar than in the United Provinces, because of the creation of permanent heritable rights. In Bengal and Bihar the exaction is imposed chiefly on the occasion of transfer, whether legal or fictitious; and non-transferability has left the zamindar everywhere scope for the appropriation of unearned increment in every Province where superior proprietors have been created. But besides this ground, both in the United Provinces at present and in the Central Provinces before the passing of the Tenancy Bill, the existence of a periodical protected tenancy depending upon the consent of the landlord and hence difficult to acquire has been a fertile cause of the levy of exactions in various guises. With regard to privileged tenants, an increase of rent by the landlord is difficult, and subject to legal control; but in the thickly populated areas of Bengal, Bihar, Orissa and the United Provinces the law regarding enhancement is often, if not commonly, evaded. Though an enhancement of rents is not difficult in Bengal, the improvement of the land is difficult. Large portions of land are let out in *patnis* with very little margin of profit for the *patnidars* who therefore are unwilling to spend any capital. A large proportion of ryots has the status of fixed rent and their rents cannot be legally enhanced even if the landlord spends money and effects improvement. The difficulty of obtaining increase of rent from the ryots on the ground of improvement is very great and both superior and inferior proprietors are generally loth to take the uncertain risk of litigation. As regards the ordinary tenants in Bengal, the Agra Province and Oudh, the laws, while preventing sudden rises in rent, do not hinder enhancement and eviction. The custom of sub-letting also has grown, in spite of legal difficulties, in Bengal, Bihar, Agra

and Oudh. This has converted the tenant into a mere rent-receiver who has taken full advantage of the general rise of prices, and further contributed to reduce the economic status of the actual tillers of the soil. In large parts of Central and Western Bengal, the sturdy class of Bagdis and Bouris has succumbed to the more intelligent castes. They have been reduced to mere labourers, while those who claim the privileges of a ryot of the Bengal Tenancy Act are often people to whom the driving of plough is a social degradation. Evils of this type have not been corrected as yet by recent legislation, such as the Oudh Rent Act. Freedom of sub-letting likewise has converted the occupancy tenant in Bengal and the peasant proprietor in many parts of the Punjab and the Madras Presidency into a rent-receiver, an absentee inferior proprietor living on rent or share of the produce. On the other hand, it is the non-occupancy tenants who not only pay much higher rent than the occupancy tenants, but also rent smaller-sized holdings and, having little security, pay higher rates of interest for agricultural capital. The marked divergence in recent years between old and occupancy and new competition rents, both in permanently settled and temporarily settled tracts, has threatened more or less the occupancy status, has led to sub-letting, and has produced the evil of *nazarana* of all kinds; and all these questions are bound up with the question of any reform in the system of tenant right. The Central Provinces Tenancy Act of 1920, in so far as it has created permanent tenure, restricted transfer and prohibited sub-letting, is a wise piece of legislation which has rehabilitated peasant proprietorship, protected cultivating interests against the moneylender, and at the same time prevented peasant proprietors from converting themselves into intermediaries exploiting the peasants below the legal peasant line. It is very interesting to find that in countries so different as Russia and an Indian province the same evils arising out of the same agricultural conditions have been proposed to be remedied by almost identical measures. In the ryotwari estates the periodical settlements have done a grave injustice to the smallholder by disintegrating the village communal system, and by appropriating a larger and larger share of the agricultural income, which if peasant proprietorship were absolute and the theory of State landlordism not carried to its present limits, would have returned into channels of permanent land improvement. The deterioration of peasant proprietorship and the accompanying free disposal of village commons on the rural communalism, as a result of encroachment and administrative policy, have proved harmful to intensive agriculture. Analogies may have been drawn with the legislative attack in England and the agrarian history in Russia.

Protective legislation for the peasant.—For remedial measures necessary to deal with the present situation we should draw freely from the experience of Japan and of the countries in Central and Eastern Europe where small holdings exist or are reconstituted by recent land reform. It must be a process of slow growth and adjustment in India, for wherever we touch the land, we handle the root system of society. Wherever we have the big estate and the estate is broken into farms which are dealt with in the produce-sharing system, we have to develop gradually towards security of tenure, on one hand, and equitable farming agreements, characteristic of the *métayage* in Italy, France and Spain, on the other. In virtue of these agreements, a veritable joint-ownership is established between the landowner and the tenant in parts of Western and Southern Europe, and the tenancy sometimes passes from generation to generation, thus acquiring effective ownership. Where we have peasant proprietorship, we should not break up the traditional village communalism, but revive the collective control over the use of the land, collective irrigation and collective cultivation. Gradually the village communities would be converted into co-operative societies so that they might make joint purchases of the necessary farm

stock, sell the produce jointly, or obtain credit in common. The case of the inferior peasantry who obtain land or stock from the richer farmers to whom a share of the produce is transferred, also demands protective legislation. The constitution of economic holdings, prevention of fresh sub-division and restriction of sub-letting and transfer seem necessary, if we wish to profit from the experience of different countries in Europe. There are, again, the farm-hands, whose condition varies in different parts of India. Some have small plots of their own or work as partners. Others move from plot to plot, while some are involved so much in debt that they sell their services for life to the zamindar's or the cultivator's family. The serf, who is still in evidence playing an important part in the machinery of Indian economic life, deserves much greater attention and sympathy than as yet he has been able to obtain. With greater solvency of the peasant farmers, with more equitable share tenancy, with the protection of the farm labourers, and with a more equitable system of taxation, we can convert the agrarian crisis, and meet a famine when it comes more courageously and more successfully, neither bewailing the mysteries of Providence, nor looting the bazaars in open revolt. The present situation is full of peril. The agrarian problem has to-day its political and social reactions; the village unsettlement and the political unrest have a direct bearing on each other.

Three far-reaching features of land unsettlement.—There are at least three outstanding features of the present land unsettlement whose effects are not confined to the economic sphere. There has been a tendency during recent years for the cultivating proprietor to lose ground to the cultivating tenant and non-cultivating rent-receiver or rent-payer. The Jotedar in Bengal, the Lingayat in Bombay and the Brahmin in Madras have given up the plough and now are dependent on the cultivating classes whose economic status has suffered. In the Punjab alone the number of rent-receivers has increased from 626,000 to 1,008,000 during the last decade. There has been also a large increase in Madras. In the permanently or temporarily settled tracts, middlemen have multiplied. Very often these classes are idle or thriftless. All this has poisoned the peacefulness of rural life and sometimes made tedious and difficult the simplest duties of routine and revenue. Secondly, the problem of industrial unrest in the cities is connected closely with the growth of the landless class in the villages. A floating immigrant population is the chief obstacle to measures of civic social improvement and amelioration. Labour legislation or housing reform, for instance, cannot be effective until the continuous cityward drift of the landless classes is checked. Thirdly, the structure of village life governs the system of polity and the change from peasant proprietor to peasant proletariat has introduced new factors in the evolution of the Indian democracy.

Oral Evidence.

37,196. *The Chairman*: Dr. Mukerjee, you are Professor and Head of the Department of Economics and Sociology in the University of Lucknow?—Yes.

37,197. We have your note of evidence which you wish to give us, for which we are much obliged; have you any corrections or statements in amplification of that that you would like to make at this stage?—On page 385 I give a table showing the percentages of cultivated area irrigated, I have added some figures for two other districts.

37,198. The earlier part of your note gives us an interesting resumé of some of the experiences of European countries in relation to the problem of small holdings and the fragmentation of holdings. On page 370 when you speak of consolidation of holdings, are you thinking of the sort of consolidation that took the shape of the enclosures in Great Britain, or are you thinking of the consolidation of an individual holding which has become

fragmented as the result of the operations of the law of inheritance in this country?—In India, we should rather think of the fragmentation of holdings which comes as the result of the application of the law of succession.

37,199. You distinguish no doubt between sub-division and fragmentation?—Yes.

37,200. Sub-division we presume to be inevitable so long as the present law holds?—But sometimes sub-division goes to such an extent that holdings become uneconomical, and then it is very detrimental to agriculture. At the same time, there are holdings which have to be scattered about in the different soil areas of a village in order to minimise the risks of agriculture as far as possible; so that the problem of fragmentation and that of the scattered nature of the holdings are connected.

37,201. In any one village when there is great variety of land, from the agricultural point of view it is a sort of insurance to the individual to have his holding in more sections than one; that is the point, is it not?—Yes.

37,202. Have you any exact knowledge of the system which you describe on page 371 under the heading: Consolidation of holdings in Baroda? There you point out that a permissive Act for the consolidation of agricultural holdings was passed in 1920?—Yes.

37,203. Do you know the nature of that Act?—I have described the Act.

37,204. And do you know the effect that its passing may have had?—It is too early yet to speak of the effects of that Act.

37,205. Have you been watching the results?—Yes, I have been watching the reports on this subject.

37,206. Have you any views on the subject at this stage?—Not yet, except that I might refer to my book on the *Rural Economy of India* where the state of fragmentation in Baroda has been described.

37,207. *Mr. Calvert*: The Act is a dead letter, is it not?—I refer to the Act merely with a view to criticising it.

37,208. *Professor Gangulee*: Is that Act still functioning in the State of Baroda?—No.

Mr. Calvert: It has never begun to function at all.

37,209. *The Chairman*: That was rather what I had gathered. On page 373 you suggest that Governments in British India might initiate an experiment in order to advertise the possibilities of consolidation?—Yes.

37,210. And that that experiment should take the shape of acquiring suitable villages under the Land Acquisition Act, re-aligning the land properly, effecting certain improvements and then leaving the object lesson to do its work?—Yes.

37,211. Have you any indication as to how public opinion in the villages concerned would view any suggestion of that sort?—The better class of cultivating tenants in this part of India adopt a system of voluntary exchange and transfer, and I think public opinion so far as the cultivators are concerned will strongly support such a scheme. I have spoken of the traditional custom in South India according to which villages come to an agreement by which they exchange plots which may be different as regards fertility and situation; that tradition is also prevalent in Oudh and other parts of India, and there is no reason why this system should be against public opinion so far as the peasant is concerned, because, after all, the peasant knows his business very well.

37,212. Nevertheless, experience does show, does it not, that there is very often considerable opposition from a minority to any scheme of general consolidation?—That opposition will naturally arise as long as we have different

grades of tenants who have protected and unprotected rights in their holdings.

37,213. You give us an interesting note on irrigation from many points of view; in some cases you quote your authority and in other cases you do not. I do not want to keep the Commission or you waiting while I ask you for your authority in each case; but if you would look that through and, where you think the figures and facts mentioned are of sufficient importance to warrant it, let us have a note of the authority concerned, it would be very helpful?—I have throughout used Season and Crop reports of the United Provinces for all the years, and also the Agricultural Statistics of British India; that literature I think you have with you?

37,214. Yes, we have those. Those are really the two sources of information?—Yes, and for the districts I have also used the Settlement Reports and District Gazetteers; that is my authority.

37,215. Then I think that covers the point. Have you studied the economics of irrigation by tube-wells in detail?—I have depended upon reports and blue books.

37,216. I wondered whether you had formed any view as to whether sufficient information was available on that matter in this Province, and, if not, whether sufficient research was being carried out?—I approached the Agricultural Engineer of this Province for some facts relating to the lowering of the water level about which I have spoken, and which I think has been one of the great handicaps to agriculture, especially in the south-western parts of this Province. His figures are very recent, and I do think research on those lines ought to be conducted in the different districts where we have complaints from the peasants as regards this lowering of the water level. I have got a statement from the Agricultural Engineer showing this decline of the water level from 1906 to 1926, which was prepared at my request. The Engineer told me that earlier figures could not be prepared, and for them I have to depend on the District Gazetteers.

37,217. On page 387 of your note you suggest that it might be possible to combine well irrigation and canal carried irrigation so as to supplement, particularly in the *rabi* season, the shortage in the supply carried by canals. Do you think that the difference in cost, to the cultivator, of water from a well as compared to the cost, to the same cultivator, of water from a canal, might raise difficulties in this connection?—As a matter of fact, in this Province more than half the irrigated area is well-irrigated, and the cost factor did not come in. In tracts where the canal has been introduced there has been a deterioration as regards the number of croppings, and well irrigation shows a more elaborate rotation of crops than canal irrigation.

37,218. I rather gathered that you were thinking of extending well irrigation to areas already supplied from the canal system?—In every part of this Province both canal and well irrigation supplement each other, and where the canal has superseded the well, agriculture has deteriorated, or, at least, become more uncertain.

37,219. So that as long as there is a definite shortage in canal-carried water, your cultivator is prepared to pay for well irrigation? But there is another suggestion of which you have probably heard: that is, that in the higher levels of areas commanded by canals, cultivators should be persuaded to supplement their supplies of canal-carried water by water pumped from wells, so as to leave more water to run down the canals and thereby increase the amount of canal water available in the lower levels?—In the higher reaches, the difficulty is also experienced that the well level has risen too high, and non-masonry wells, which are very common in this part of India, go out of use.

37,220. I suppose it is not very difficult to persuade the cultivator to use canal water when it is available instead of his having to use well water?—There is such a thing as habit.

37,221. And there is such a thing as having to pay a little more for the water, I suppose?—Well irrigation is generally responsible for a more elaborate system of rotation of crops.

37,222. On page 387 you say: "As the rainfall seems to be the ultimate limiting factor in agricultural progress, a more systematic policy of afforestation . . . . must be followed?" To what extent do you connect rainfall and afforestation?—It is an admitted truth that the denudation of the hill-sides and the destruction of forests have reacted very unfavourably upon the regularity and distribution of rainfall in Northern India. We see now the Indian desert gradually extending towards the south-western districts of this Province. There has been a very great diminution of rainfall within recent years, and it has also become very irregular.

37,223. No doubt deforestation encourages soil erosion and affects the whole problem of the run-off drainage, and so on, but do you think that forests affect the rainfall?—Forests do increase precipitation, and investigations in America in the Mississippi Valley have shown that the forests are responsible for greater precipitation in the south eastern districts.

37,224. That is the theory held by certain persons? But do you happen to know whether it is held by the Meteorological Department in India?—The Meteorological Department will certainly support this.

37,225. In a supplementary note on page 398, you give us your views on the general land situation in India. Any suggestions for the reform of the tenancy laws are, as you probably know, altogether outside our terms of reference; but we are quite prepared to hear your views as to the effect that the existing laws and practices have upon cultivation and the well-being of the cultivator. You attach great importance, I understand from these notes, to that fact?—My main point is this, that unless you improve the land tenure and the revenue system there will be a drag on the improvement of agriculture. There has been in recent years a tendency for the cultivating proprietor to lose ground to the non-cultivating rent-receiver. In every part of India there are a class of what may be termed intermediaries and parasites who intercept a large portion of the profits from agriculture. Unless we have a thorough overhauling of the land system, I am afraid the recommendations of this Commission will be of no great avail so far as the prospects of improving the condition of the actual tiller of the soil are concerned.

37,226. Do you regard the tenancy laws as one of the most important factors?—Yes.

37,227. If that is so, would you not expect to find a greater disparity than in fact exists between the state of the cultivators in zamindari areas and that in ryotwari districts?—In the ryotwari districts we have under the proprietor a large number of middlemen who separate him from the actual tiller of the soil, while in the permanently and semi-permanently settled tracts there is, as a result of sub-infeudation and sub-division of rights in land, a class of rent-receivers who are getting more and more of the profits which really ought to go to the actual tiller of the soil.

37,228. Have you ever studied the economics of actual holdings, typical of holdings held by cultivators in this country?—I have undertaken intensive surveys in many parts of this country.

37,229. Have you ever carried them out?—Yes.

37,230. Would you tell the Commission where you carried them out?—The Lucknow University has been making different inquiries in the districts of Agra and Oudh, and we have also been conducting investigations

regarding the conditions of employment of agricultural labour, the average agricultural indebtedness, the size and distribution of holdings, and so on.

37,231. Through what agency are you carrying out these inquiries?—Through the post-graduate students.

37,232. Of what ages are those persons?—From 22 to 26 years of age.

37,233. Are they graduates?—Yes.

37,234. Are they, as a rule, men with any experience of rural life?—They are generally villagers.

37,235. And they carry out their inquiries according to a fixed schedule?—I do not give them a questionnaire to go by, but I guide their inquiries step by step and materials are gathered as new points of view are brought forth from the villagers.

37,236. *Professor Gangulee*: Have you published any book in connection with that?—The University hope to publish a monograph on the subject.

37,237. *The Chairman*: Is it not a fact that people who live in towns the world over, as a rule, know very little of the agricultural conditions?—In India all people are villagers.

37,238. Are they?—Yes; the cities have been of very recent development. As a matter of fact, by habit, tradition and psychology, we are all villagers.

37,239. Do you think the average graduate of an Indian University knows all about rural life?—The difficulty is this, that in most Universities agricultural economy is taboo; we are teaching a new type of urban industrial economics with which they are very unfamiliar and which has emerged from a study of Western life and conditions.

37,240. *The Chairman*: Do you think there is room for a Degree in Rural Economics?—In some Universities rural economics form a very important subject; in the Lucknow University, for instance, there are three papers and we give the M.A. Degree in Rural Economics. We have an independent paper on Indian Agriculture, another on Land Tenures and Agrarian Legislation, and a third one on the Co-operative Movement in India. Mr. Calvert has been one of our examiners.

37,241. Are you devoting a great deal of your own teaching time to rural economics?—Yes, I am teaching rural economics and sociology; and for the last five years I have been writing books on rural economics as well.

37,242. What proportion of your pupils come from rural districts?—They all come from the villages with the exception of one or two.

37,243. And how long have these lectures in rural economics been established in the University?—For the last three years.

37,244. So that it is difficult to gauge the effect yet?—So far we have investigated certain rural economic conditions and we are going to publish the results. The advanced students have been allowed to substitute for a paper in the written examination a thesis based on local surveys, and some of these surveys are being published now.

37,245. Do you find that interest is being taken by undergraduates in these lectures?—Yes.

37,246. They are enthusiastic about the subject?—Very enthusiastic I should say.

37,247. Are you satisfied yourself with the way in which these young graduates have carried out the economic surveys that you have arranged for?—The best students usually understand the methods of such surveys, and so far I am satisfied with their work.

37,248. Do they report as to the attitude of the villagers towards an inquiry of that nature?—At first they had to combat the fears and suspicions of the villagers, but gradually these fears and suspicions were dissipated.

37,249. Suspicions about new taxation, I suppose?—Yes; but gradually they were won over and they gave the right information.

37,250. *Sir Ganga Ram*: You have nothing to do with the Agricultural College?—No.

37,251. You are preparing students for a commercial degree?—No; I am preparing students for the M.A. degree in Economics.

37,252. Economics is a general term; what economics do you refer to?—Rural economics. There are alternative courses in economics and one course is rural economics.

37,253. What are the prospects in life of your pupils? What do they ultimately become?—They become teachers in colleges and Universities, and they are also absorbed in the Co-operative Department of the Government.

37,254. They do not go into agriculture?—No; we teach economics more than agriculture in our University.

37,255. Are all your figures with regard to irrigation based on your personal knowledge?—They are based on the Season and Crop Reports and also the Agricultural Statistics of the Government of India.

37,256. Have you any personal knowledge of agriculture?—Yes.

37,257. Where did you practice agriculture?—I have not practised agriculture, but I have seen farming in different parts of India.

37,258. Have you seen it in the Punjab?—Yes.

37,259. Where?—I was for some time in Lahore.

37,260. Have you any knowledge of tube wells?—I have no direct knowledge of them; I am not an engineer.

37,261. Is the whole Province supplied by canal water?—I have said in my note that 50 per cent. of the irrigated area of this Province depends on wells.

37,262. *Sir Thomas Middleton*: In connection with agricultural labour you refer to payments in kind. Are these payments in kind the rule or the exception in this Province?—They are the rule rather than the exception.

37,263. Can you give any information as to whether other parts of India show differences in this matter? Are there areas in India where the payment is only in kind?—As we approach the industrial centres in different parts of India we see more and more payments in cash rather than payments in kind.

37,264. You have noticed, no doubt, the very great variations in the money wages of labourers in the different parts of India. If you compare this variation in local wages with the variation in local prices, you will find that the variation in prices is relatively small. How do you account for the great variation in cash wages?—Grain wages are usually fixed by custom, and custom takes a long time to change. On the other hand, cash wages are far more mobile. We undertook an enquiry into the relative differences of money wages and real wages of agricultural labourers in a district in the United Provinces and we found that the curve of agricultural wages did not follow the curve of prices; in fact it lagged behind. That shows that it takes a very long time for village conditions to adapt themselves to the new conditions.

37,265. Did it lag one season behind?—No; it lagged behind throughout.

37,266. Has there been a gradual rise or was there a sharp rise in 1919 and then a decrease?—No. Investigations of this type have been undertaken in Bombay by the Bombay Labour Office and Professor Myles undertook a similar investigation in Lahore; but we cannot at present say anything definitely about the relative difference between the money wages and real wages in the different parts of India.

37,267. We found, in questioning a landowner in the United Provinces, that he was paying 4 annas for a male labourer, and I think in Bombay they pay 8 to 10 annas per day. How do you account for the wide difference in these two Provinces when the price of provisions is fairly similar in both?—In this Province we have a larger surplus of agricultural labour population than anywhere else in India. In Bombay the factories are still clamouring for more and more agricultural labourers, while Cawnpore cannot absorb the full volume of the labour supply of this Province. Jamshedpur and the mines in Bihar do attract a large amount of labour, but still agricultural conditions are very much depressed as a result of the enormous number of agricultural labourers in these Provinces.

37,268. I understand that there is a good deal of emigration from certain districts of these Provinces to Assam and other tracts?—But even when we speak of the exodus to the Assam plantations there have been years when this emigration was suddenly checked because the money wages in those plantations were found to be on a level with, or even lower than, the agricultural wages in districts like Benares, Gorakhpur and others. But now the tea industry has recovered and the emigration is continuing.

37,269. What is the effect of that migration on wages paid in the districts from which emigration takes place as compared with the other districts?—It has not been such as to affect materially the prevailing wages in those rural tracts.

37,270. You have not been able to discover in your economic studies any definite relationship between emigration and the rate of wages?—Not as yet in the rural districts. If the volume of emigration continues for a very long time and if the wages continue to be much higher, there will surely be a rise in agricultural wages; but that is a state of things which we cannot contemplate at present.

37,271. You mention the passing of land into the hands of the non-landowning class. You are referring, I think, mainly to lands handed over to moneylenders on mortgage? Is that what you had in mind chiefly?—No. As a result of the fact that the Indian Tenancy Law contains no effective restrictions on subletting, the cultivator proprietor is becoming more and more dependent on the cultivating classes. There is, in the first place, the mortgaging and the transfer of land to non-agriculturists; but there is also at the same time the tendency during recent years for the cultivating tenant to become more or less an inferior landlord, so that his holdings are let to people who have no legal protection against enhancement of rent or eviction. This danger is effectively combated in the Central Provinces, but it exists in almost every other Province.

37,272. I have heard that there was a tendency in that direction during a few years, when cotton prices were high, for example; but I should think that that particular tendency has now disappeared?—There is a village twenty miles from Amraoti where I found that the *Lingayat* was subletting his land at ten times the rent which he gives himself to the landlord; it is a cotton-growing village.

37,273. Turning to another point: what about the effect of the narrow market for capital on the price of land in India? There has been in recent years a certain accumulation of wealth in India and the scope for invest-

ment is limited in a country with so few industries as you have. What effect must that have on the price of land which comes into the market?—In India, so far as the middle and professional classes are concerned, investment in land gives them a social status, and so they seek investment in land more than investment in industry or trade; that is the reason why our lawyers and other professionals are acquiring land in the villages.

37,274. Apart from that desire to improve their position, is there not a real tendency to seek a real economic investment in land because it is regarded as a safe investment?—It would have been called an economic investment if they participated both in the risks and in the profits of agriculture. Here there are a large number of intermediaries, and their encroachment upon the land held by cultivating classes means that they get the surplus profits of agriculture which formerly were enjoyed by the cultivators themselves.

37,275. You use the phrase "the decline of peasant proprietorship" In what sense do you use the word "decline"? Decline in the state of the individual peasant or decline in the total area occupied by the peasant?—I mean the latter, the total area. More land is now held by cultivating tenants which was formerly cultivated by peasant proprietors themselves. There is also a deterioration of status due to the fractionisation of holdings.

37,276. *Sir James MacKenna*: What text-books do you use in Indian rural economics?—Books by Mr. Calvert, Mr. Darling, Mr. Keatinge and Mr. Moreland; I have also some publications of my own.

37,277. Do you agree that one of the main obstacles in the way of agricultural improvements is the smallness of the holdings?—Yes.

37,278. I would like to put a case before you as an economist. I have heard it suggested that all small holdings should disappear, that large holdings should take their place and that the landlord should hire the present small holders as labourers, applying the improved methods of cultivation and ensuring a fixed wage to the small cultivator against bad monsoons and all other troubles; this, it was submitted, would be a better position for every one; the out-turn of land would increase as a result of improved agricultural methods and the wages of labourers would of course increase. What is your view of that position?—That line would suit a new country where there are large estates and no people to work. How will you employ the displaced rural population?

37,279. You can employ them as labourers?—The industrial development of India has not proceeded so fast as to absorb the vast agricultural labour population of this country.

37,280. You do not agree with that view?—The intensive enquiries conducted by me show that one-half of the tenant population in Oudh possesses holdings whose size is below the subsistence limit of three acres.

37,281. But then there would be fixed improved wages?—There would be much economic unsettlement and unrest.

37,282. *Professor Gangulee*: What exactly do you mean by the expression "economic solidarity" of the joint family?—I mean solidarity based on the collaboration of the different members of the family in agricultural work.

37,283. Are you definitely of opinion that economic solidarity of the joint family of which you speak is a help to rural economy?—It has been a great help in the rural areas.

37,284. Is it still now?—Yes, it is now.

37,285. You say on page 372 that "the secret of the success of the more prosperous cultivators lies in a determined adherence to the joint family system." Could you amplify that statement a little?—In the first place, the joint family has meant that the different members of the family, in-

cluding also the women, take an active part in field work; in the second place, it has also meant that the holding is managed by the best member of the family. The tradition is very common amongst the villagers that when any of the younger sons insists upon a partition, they do not divide the property at all, but the deserter is settled or accommodated in a different village altogether. If this tradition has continued, it is indicative of the great economic opportunity which is derived from the joint family so far as agriculture is concerned.

37,286. Do you consider that these traditions are still very much alive?—The traditions are very much alive in this part of India.

37,287. And will it survive under the impact of the present day economic tendencies?—Yes; in the Punjab, the joint family instead of disintegrating amongst the peasants is actually gaining strength. The recent Census Report of the Punjab goes to prove this.

37,288. You are of opinion that this tradition of the joint family has been affected by the importation of individualistic doctrines of property?—Yes.

37,289. And you suggest that we in India never had the individualistic notion of property before?—Not in the sense of free transfer and sale of cultivated land which we have got from the English law and the modern court decisions.

37,290. On page 370 you speak of the low standard of subsistence. Would you associate the low standard of subsistence with the density of population of a given tract? You seem to suggest there that in the more populous part of the country the conditions of agriculture are such that it is no longer profitable?—High density of population does not necessarily entail a low standard of living; there are parts of India such as Eastern Bengal, parts of the Punjab and Travancore, where, in spite of a density of population four or five times that of agricultural Europe, a population can be maintained at a fairly high standard of living, and a standard which is being gradually improved day by day.

37,291. It depends not only on the method of cultivation but also on other economic factors?—Yes; for instance, the system of rotation of crops in Eastern Bengal is an object lesson to India, and the standard of living of the peasant in Eastern Bengal would be much higher than the standard of living of the Italian, Spanish and Balkan peasantry.

37,292. What is the elaborate system of rotation in the well-irrigated areas of which you speak?—In many parts of these Provinces canal irrigation has reduced a two-crop system of farming to one of only one crop, and in that way the system of farming has been lowered.

37,293. Given water, they can grow other crops?—Yes, in the districts of Gorakhpur and Basti we have several croppings, and it is the elaborate rotation of crops which is responsible for the high rural density of these districts.

37,294. You discuss this question of consolidation of holding in Baroda, but you make no mention in your note of the Punjab consolidation work?—Mr. Calvert's scheme is too well known and it requires no reference.

37,295. Have you studied and observed the working of the Punjab system?—I have only studied that from the reports; when I was in the Punjab I had no opportunity of studying it.

37,296. Do you think that system could be applied to other Provinces?—Yes; in fact the co-operative movement is only utilising an indigenous tradition. In parts of this Province, there is a vital tradition with regard to the voluntary exchange of holdings: when peasants find that their holdings have become much too scattered, they assemble in the panchayat and bring about a co-operative or voluntary transfer of holdings so as to make

them into more compact blocks. In that way the co-operative societies are merely utilising or emphasising a tradition which was very much alive but which is now decaying.

37,297. Is this tradition found anywhere except in this Province?—Yes; so far as I know, I find vestiges of that tradition in every part of India.

37,298. You think that tradition might be revivified through the co-operative societies?—Yes; but the difficulty is that, in some Provinces, holdings have to be scattered so that the holdings may be situated in different soil blocks in order to minimise the risks of agriculture as far as possible, depending, as it does, on rainfall. In tracts where agriculture is less dependent upon rainfall a scheme of consolidation would have better chances of success.

37,299. So that before you attempt consolidation, you have got to satisfy the first pre-requisite, namely, facility for irrigation?—Yes.

37,300. And the second pre-requisite?—In case the population be very dense, we must provide employment for the displaced population.

37,301. You speak of an economic cultivation unit; in the course of the enquiries you have been conducting in the University of Lucknow, have you been able to find out what you describe as the economic cultivation unit in different tracts of the Province?—It is three acres intensively cultivated; that unit of course varies with reference to irrigation and other factors. Naturally it varies with reference to rotation of crops, fertility of soil, nearness to the market, but on the whole you may say that three acres would represent the average size of the economic cultivation unit. Below that limit the peasant has to starve or his standard of living has to be lowered.

37,302. In how many districts in the United Provinces have you carried out this investigation?—In four or five districts chiefly.

37,303. Will you tell the Commission how you arrive at these figures?—I shall publish it very soon under the title *The Fields and Farmers in Oudh Villages.*

37,304. You say that, in Agra and Oudh, in the absence of fixity of tenure the tenants have no desire to improve their holdings?—The non-occupancy tenants have no fixity of tenure.

37,305. Do non-occupancy tenants predominate in Agra now?—Yes.

37,306. Has not their situation improved since the passing of the Agra Tenancy law?—It has improved their position, but only very partially; it has not gone very far.

37,307. *Mr. Calvert*: On page 368 you say the tendency towards sub-division has been manifest in India only during the last few decades. Is that statement based on a careful study of village maps over a series of years?—Yes. I would refer in this connection also to Dr. Mann's *Land and Labour in a Deccan Village,* in which the history of sub-division of holdings in a village for the last three centuries has been given. There we find that it is only during the last few decades that this tendency has become particularly manifest.

37,308. That is in one particular village?—Yes, that was the result of a very intensive enquiry in a particular village, and similar enquiries in different parts of India have strengthened the presumption that this phenonemon is of very recent growth, because it is definitely connected with the enormous multiplication of population, which is very recent.

37,309. Has there not been a certain amount of expansion of cultivation in the last 50 or 100 years?—Yes.

37,310. Do you think the increase of cultivation in the villages has led to fragmentation?—Where the population has multiplied enormously within

the last three or four decades the effect of the tendency to which you refer has become manifest with regard to sub-division, but not otherwise.

37,311. That is to say, they have brought under cultivation odd pieces of land which give the appearance of fragmentation?—That would emphasise the scattered nature of the holdings rather than fragmentation.

37,312. Are you in favour of emigration overseas as a means of relieving excessive pressure of population?—Certainly, but the restrictive policy adopted in some countries gives us very little hope in that direction. I would depend more upon inter-provincial emigration, and I think it is necessary for Government to open out new facilities for emigration to labour districts.

37,313. Do you think, with regard to emigration, there is a conflict between sentiment and economic advantage?—So far the peasant of the United Provinces has not shown himself conservative or stay-at-home at all; he has gone to distant malaria-stricken plantations in Assam and he has gone to distant Africa.

37,314. And improved his position?—Yes.

37,315. So that there is a certain conflict between the economic aspect of the question and the sentimental aspect?—What do you mean by the sentimental aspect? Of course, a peasant likes to continue in his home.

37,316. Do you think the politician wants to prevent the peasant from going although the peasant by going overseas can improve his position?—I think there are very few politicians who are opposed to the emigration policy.

37,317. *Professor Gangulee*: They are against the indentured labour system?—That was a vicious system.

37,318. *Mr. Calvert*: You refer to cycles of wet years and dry years. Do you think there is such a thing as a recurring cycle of wet and dry years?—Yes, there is.

37,319. Do you think we have sufficient evidence to support that statement?—I have submitted my suggestions in a very tentative form, but so far as recent data are concerned, we have one wet cycle followed by two dry ones, and now from 1916 onwards we are in the midst of a wet cycle; very probably it will be found to have ended in 1926, and we expect 1927 to be a dry year.

37,320. For how many years do you think we should secure records before asserting that we have found a cycle?—This is the evidence not of the economist but of the meteorologist in India; I have drawn my opinion from the meteorologist.

37,321. You refer back forty years?—1886 is my starting point.

37,322. Do you think forty years is sufficient?—It was sufficient for the meteorologist to establish that hypothesis.

37,323. Of which meteorologist are you speaking?—You will find this subject discussed in the Season and Crop Reports of these Provinces.

37,324. In your note and in your oral evidence you have referred to the increase in the number of landlords living on rents?—Inferior landlords.

37,325. Does that point to increasing prosperity: that now the rents are so high that they can live on the rents without having to work?—That has happened in some Provinces, such as the Punjab and Eastern Bengal, where there has been an enormous rise in land values.

37,326. After all the ideal of mankind is to live without working?—That is a fact.

37,327. So that more and more are achieving this ideal?—We want partners rather than parasites.

37,328. You point to a decrease in farm servants and field labourers and an increase in those who have taken to cultivation? These have passed into the tenant class, I take it?—Not necessarily; they may have left the Provinces for work in the factories, mines and plantations.

37,329. But the number of cultivators has increased?—You are speaking of the Punjab?

37,330. No, you are quoting a whole series of Provinces all of which show the same result, that is to say an increase in cultivators and a decrease in labourers? Does that not show that the labourer is passing into the cultivator class?—Yes, in some cases that is so, but in others they are actually displaced in the villages and have to seek employment abroad.

37,331. You do not think that this is due to the fact that the labourer is improving himself by becoming a cultivator?—That does not necessarily imply any improvement in the agricultural condition. It may be that he acquires sometimes the status of an occupancy tenant, but in most cases, as I have just said, the labourer has to seek his living elsewhere on account of the depressed conditions. In Madras the *mirasdars* have also been faced with the same difficulty in obtaining their labour force to work on the farms.

37,332. On page 390 you say: "By a selective process, the superior cultivator is driving the more thriftless of his brethen to the marginal areas." Do you mean that this has actually taken place?—This is a universal tendency, and investigation shows that this is actually the case.

37,333. Then you say, "the extension of cultivation results, if at all, in a gradually diminishing return to an increasing amount of labour and expense." Do you think that has taken place in the Punjab Canal Colonies? —There you are dealing with a new country where new lands are being reclaimed and the conditions are very different from the conditions in an old Province like ours.

37,334. This only refers to an old Province?—Yes, not only to the United Provinces but also to Bihar and Orissa.

37,335. *Professor Gangulee*: And Bengal also?—Yes.

37,336. *Mr. Calvert*: Then you say that "the figures of the transfer of land by agriculturists to non-agriculturists show that the tendency of the latter to take possession of the agriculturists' land is to a certain extent increasing . . ." Have you any figures for the United Provinces showing the transfer of land to non-agriculturists?—The United Provinces Settlement Reports give no figures relating to the transfer of holdings to non-agricultural classes, but I have got figures from Bihar and Bengal. I have tabulated the figures for some of the Bihar districts and also for Bengal.

37,337. With regard to the transfer of holdings to non-agriculturists?—Yes.

37,338. Are these mostly moneylenders?—Yes. I have a very interesting table* which shows the distribution of sales in the district of Saran among landlords, lawyers, moneylenders and ryots. According to this the shares of the lawyer and the moneylender have increased, whereas that of the ryot has fallen. The report of the Survey and Settlement operations of the district of Saran between the years 1913-19 shows that the number of transfers by sale or mortgage to the moneylender has increased alarmingly.

	Last settlement.	Present.
* Landlords	5·77	3·80
Lawyers	·92	1·70
Moneylenders	9·35	22·95
Ryots	83·96	71·55

37,339. Have you any figures to show the increase in the number of moneylenders in the United Provinces?—No; there is nothing.

37,340. *Professor Gangulee*: What about Bengal?—The tendency is the same there.

37,341. *Mr. Calvert*: Have you in your inquiries found any connection between the cultivator's idea of what a pair of bullocks can do and the amount of land he cultivates?—Yes, in many parts of India the cultivator does not measure his land in *bighas*, but in pairs of bullocks. One pair of bullocks in this Province would, I think, cultivate three or four acres of land. In Gorakhpur, where the population has multiplied enormously, the people cannot afford to keep cattle, and cattle are borrowed from other cultivators who possess them. The problem has become very acute in some of the eastern districts now.

37,342. I should like to have your opinion on a proposal which has repeatedly been made to us, namely, that we should recommend a cess on the export of wheat and rice in order to build up a fund to pay for research in wheat and rice?—I am strongly against an export duty on agricultural produce; but the case need not arise here because the whole problem has been set at rest by the Report of the Fiscal Commission.

37,343. It has not been set at rest so far as we are concerned. Do you think that the imposition of a cess on exported wheat would have the effect of bringing down internal prices?—I think it would be very injurious to the peasants.

37,344. *Mr. Kamat*: With regard to Question 25, under "General land situation in India," you say: "Neither scientific agriculture nor co-operation can make much headway unless we reform the land system, now so serious a drawback to the prosperity of the small farmers." Suppose you were to write on a clean slate and you were left to yourself in this matter, what sort of land system would you have for India?—It has got to be adapted to particular conditions and to the historical traditions in the different Provinces. For instance, in the Punjab and Madras, you have peasant proprietorship; in Bengal you have another system. There is ample scope for tenancy reform in Bihar, in Bengal and in the United Provinces as well.

37,345. Would you retain these local conditions?—Yes.

37,346. And only improve them?—Yes, gradually. At the same time I believe that, without reform, improved scientific agriculture has very little hopes of success.

37,347. *Sir Ganga Ram*: In what direction do you want a reform?—That is a very vast problem, which is beyond our scope.

37,348. *Mr. Kamat*: You say: "The inefficient system of agriculture that prevails indeed is connected less with tillage practice than with the forms of tenure now overshadowing the ancient peasant proprietorship." Do I understand you to say that, where the ryotwari system prevails, there the farmer is better off than in other tracts of the country?—In the permanently or semi-permanently settled tracts, on account of the importation of a large number of intermediaries, the whole profits of agriculture do not go to the tiller of the soil, so that the cultivator is as badly off in Madras as he is in Bengal or Bihar or the United Provinces.

37,349. But where the ryotwari system prevails, has the cultivator improved in his purchasing power distinctly, as compared with the cultivator where intermediaries prevail?—No; in the ryotwari tract the Government, by increasing the land assessment from time to time, is encroaching upon the peasant's stock of agricultural capital; the peasant has perforce to stint his standard of living in order to meet the growing demand.

Dr. Radhakamal Mukherjee.

37,350. Do you frankly mean to say that what the intermediary pilfers in the tenancy tract, the State pilfers in the ryotwari tract?—I would not use such a strong term as "pilfers," but I do think that a modified State landlordism which, in reckoning economic rent, assures the cultivator an adequate standard of living and a return of the land revenue to the labourer in wages that will increase his efficiency is the line of future reform.

37,351. In this Province we have been told by a witness representing the Revenue Department that revenue settlements have been growing more and more liberal, and he supported his statement by showing that at one time they were 20 per cent. of the total outturn and they have now come down to something like 2 per cent.?—I submitted a note on the taxation of agricultural incomes before the Indian Taxation Enquiry Committee, showing the rates of assessment in the different Provinces.

37,352. I am asking you about your own Province and what your view is about this definite statement made on the basis of facts?—I am not able to follow you.

37,353. What the witness said was this. In 1840, if the assessment was 20 per cent. of the outturn per acre, at the present day it has come down to much less; it is now 2 or 5 per cent. of the outturn per acre—in kind translated into values. Therefore, your theory that the State is pilfering from the increase in the yield of the cultivator does not hold good if that statement of the Revenue Department is to be accepted?—I may say this with regard to the land revenue of the United Provinces. In 1886-87 the land revenue of the Proivnces was 580·7 lakhs, in 1902-3 it was 636 lakhs, and in 1922-23 it was 914 lakhs. The index numbers of agricultural income per head are respectively 100, 106 and 130. The corresponding figures for total cropped areas are 35 million acres, 34 million acres and 33 million acres.

37,354. *Mr. Calvert*: Have you worked out the gross value of the produce?—It is difficult to work it out for a whole Province. What happens is this: either there is an over-estimate of the profits or an under-estimate of the expenses of cultivation.

37,355. *Mr. Kamat*: What is your total land revenue in this Province?—It was 914 lakhs in 1922-23.

37,356. What was it about ten years ago?—521 lakhs.

37,357. So it has been steadily increasing?—Yes.

37,358. So it does not support the statement that the revenue assessment is going down?—I think he meant assessment on the profits of cultivation; I cannot say.

37,359. You say on page 399: "The creation of landlordism, both of superior and inferior grades, and the break up of peasant proprietorship and the village system in India, have been the result of misunderstanding on the part of early British administrators who derived their lessons mainly from the agricultural history of Western Europe." Would you explain what you mean exactly by that, taking your own Province as an example? Do you mean to say that the village system, or landlordism, or the talukdar system, was not an ancient system?—Landlordism of the feudal type did exist in India; but now landlordism has become the universal type in most parts of Northern India.

37,360. What is the new system which has been introduced on the model of Western Europe?—When the English Settlement Officer came to Northern India he thought that the greatest handicap to agriculture was the communal routine. As the village community came to decline there was the decline of those traditions of agricultural partnership, for instance,

the common maintenance of pasture lands, the maintenance of irrigation channels and tanks and so on.

37,361. *Professor Gangulee*: Did the village community decline as a result of the Settlement Officer's operations?—In interpreting some of our old customs, he was governed by individualistic notions. He felt that free sale and transfer of land were the only opportunities which could give the present owner an opportunity to improve himself.

37,362. *Mr. Kamat*: In the Indian States, does the old village system prevail intact?—There has been enormous change there also.

37,363. Since communications, telegraphs, local bodies, etc., must come in, a certain amount of change from the old system is inevitable?—Yes. In the Punjab we had to legislate against the transfer of land from agriculturists to non-agriculturists. That would not have been the case when the village communities all along exercised the right of pre-emption which exists in the different parts of India. The panchayat was there, and it made it impossible for the moneylender from the outside to come in and get a slice out of the land of the cultivator in the village. Now, in so far as the British law has retained the law of pre-emption, it means that we still think that the village community has not outgrown its uses.

37,364. So the problem is we have to adjust ourselves to the new conditions and yet resuscitate, where possible, the old system. Have you heard of the efforts made to introduce the village panchayats and the result of those efforts?—I think that if the village panchayats are entrusted with the powers of taxing the villagers for the maintenance of village channels, tanks, pasture grounds, education, or the treatment of village cattle against epidemics, it would be a very good thing.

37,365. In certain provinces, in spite of the passing of the Village Panchayat Act, village panchayats have not grown, and it seems that people do not like to resuscitate the panchayats for fear of taxation?—That is because full powers have not been given to them. For instance, the final authority rests more with the District Magistrate than with the president of the panchayat. If you believe more in the panchayats, they will show better work.

37,366. In one place in your statement you say the economic position of the smallholder has deteriorated. Here, again, evidence has been tendered before us to show, on the other hand, that the smallholder has a surplus in normal years. Do you agree with that view?—I have given a *resumé* of the recent agrarian history, and my main point is that as a result of the multiplication of population and as a result of the changes in landlordship and tenantry which have brought about a large number of intermediaries, the small cultivating tenant has suffered very much.

37,367. In spite of the rise in prices?—Yes.

37,368. You say: "In Madras field labourers are sometimes required to work with two intervals from 4.30 a.m. to 6 p.m." Have you made personal observations?—Yes; I have been there myself.

37,369. You say: "In the Bombay Presidency, men engaged for one year work from 7 a.m. to 6 p.m." Is that also correct?—Yes.

37,370. When you mention these facts about hours of labour and so on, what actual definite suggestion have you at the back of your mind to improve the lot of the labourer?—We should think about some legislation to protect the agricultural labourer against these long hours of employment under unhealthy conditions.

37,371. You mean, on the model of factory legislation regulating the hours of work? You want that field labour also should be regulated by legislation?—Yes; of course, the whole question needs very detailed consideration.

There are great difficulties in applying legislation to this field. For instance, agriculture is not systematised. During the harvest season, or when the monsoon breaks, the labourers have to work for long hours; otherwise the whole season's crop would suffer. These conditions have to be studied very carefully, and they will be different in the different Provinces

37,372. Supposing you have recourse to legislation, do you not think you will be unsettling the ordinary normal conditions of village life to such an extent as to affect the profits of agriculure?—I do not think so.

37,373. Is it your experience of the workmen in this country that, given shorter hours, they work as sincerely and as honestly as they really ought to?—The experience of the Indian factories has been that the shorter hours of labour have have been accompanied by larger industrial output.

37,374. Will it apply to field labour?—It will.

37,375. *Sir Ganga Ram*: Are you holding the same position as Mr. Myles holds in Lahore?—Yes.

37,376. Can you tell me how many of the students who go up to B.A. or M.A. take up mathematics?—There are approximately 250 students in the economics classes and 100 in mathematics.

37,377. For what reason do people take up your subject?—Is it because they can get through easily?—People now wish to learn such subjects as economics and political science; they take interest in these matters.

37,378. What is the career open to such students?—It is a part of liberal education, in the first place.

37,379. After all, mere education does not provide the means of subsistence. With what career in view do they take up such subjects?—We do not teach for the sake of the career; we teach the subject for its own sake.

37,380. But the students take up their studies only with a view to taking up some career?—It is for their guardians to look out for their careers.

37,381. In the Punjab, out of 1,000 students, 800 take up economics. Is your curriculum here the same as in the Punjab?—I have not studied the curriculum in the Punjab.

37,382. Are you also preparing the boys for the Commerce Degree?—We have a separate Commerce Faculty.

37,383. Are you the Professor for that Faculty also?—No; the Faculty of Commerce is quite separate; economics is a part of the Faculty of Arts.

37,384. You do not take up those subjects?—No; commercial subjects, such as banking, insurance, bookkeeping, accountancy, are left to the Faculty of Commerce.

37,385. In the Punjab the student of economics is regarded as being a jack of all trades and master of none?—I know, but I hope I do not create that impression.

37,386. I do not know how it is in the United Provinces, but in the Punjab boys from the Commercial College are regarded as being at a discount in the commercial world; when a young man applies for a position in a bank, for instance, and says he holds the degree of Bachelor of Commerce, he is rejected. Can you account for that?—Our students are accepted in the Government as well as in mercantile establishments.
Then I may be wrong in regard to that.

37,387. You say that the rotation system of Eastern Bengal is an eye-opener to the whole of India. Will you explain that?—I am speaking of the number of croppings that a cultivator gets from his field; there are three varieties of rice, besides there are *arhar*, vegetables and the pulses.

37,388. There are not three varieties of rice in the same field, are there?—Yes, in the same field, they grow in different seasons of the year.

37,389. Have you personal knowledge of the outturn of those three crops of rice?—I have no figures with me.

37,390. Well, I will tell you: the total of the outturn of all three crops is not equal to one in the Punjab?—Unless you give me facts to substantiate that, I will not accept it.

37,391. You said that canal irrigation had reduced your two crops to one; what two crops were you referring to?—The *kharif* and *rabi*, and where it is not a perennial irrigation canal, the one crop has suffered.

37,392. Then canal irrigation should be regarded as being at a discount?—Yes, it is in some areas. When you discuss agriculture you have always to remember local conditions and circumstances.

37,393. Yes, but I know from personal knowledge that where well irrigation and canal irrigation go together, the cultivators are clamouring for canal irrigation?—That is perhaps true of your district.

37,394. They want to extend canal irrigation; why is that?—Because it has suited the system of farming which is prevalent in your locality, the particular soil and climatic conditions.

37,395. You said that a holding of three acres was sufficient?—Yes.

37,396. What is the gross value of the produce of three acres?—I cannot tell you that off-hand; but that is the conclusion arrived at as the result of detailed investigations. As I have told you, this will be placed before the Commission in book form very soon.

37,397. It is not out yet?—It is not yet printed.

37,398. When you speak of "agricultural labour" do you mean labour employed in agriculture or labour derived from agriculture?—I use that expression in the same sense as that in which it is used in the Questionnaire of the Commission.

37,399. When you speak of "agricultural labour" do you mean the labour of people of the agriculturist class who have not got land to cultivate, or do you mean outside labour employed in agriculture?—The labourer who is employed as a farm hand to aid the tenant or the cultivating proprietor.

37,400. *Sir Thomas Middleton*: You have given us a number of facts as to hours, wages, etc., in your memorandum; have those facts been derived mainly from the Settlement Reports of the districts?—No, they were obtained by me as the result of intensive enquiries in different parts of India; I have travelled in every Province in India. The Settlement Reports are silent as to the hours of labour of the farm hand.

37,401. I think some of the figures you give as to serfdom were taken from the Settlement Reports?—Those with regard to Bihar were taken from the Settlement Reports, but I also made an enquiry myself some months ago in Chota Nagpur, and I found a system of serfdom still prevalent in spite of the legislation to the contrary.

37,402. You spoke of the high standard of cultivation attained in Eastern Bengal. What is that due to?—In the first place, they cultivate a money crop, jute; in the second place, agriculture in Eastern Bengal depends not merely upon the annual inundation from the Ganges but also upon the flood from the Brahmaputra, and these floods are so timed that they have two or three croppings in some districts. Lastly, the deltaic soil is very fertile.

37,403. You have favourable natural conditions and you have a money crop which brings in a large amount of money. Is not the supply of fish

to supplement the rice crop another very obvious factor in the economic position?—Yes, fish is a very important source of wealth.

37,404. You were rather definite in the view that cycles in the weather recur?—That hypothesis is not mine; it is the hypothesis of the meteorologist, and if you have any quarrel with that hypothesis, it is not my quarrel.

37,405. I wondered whether you had used the right word; did you not mean that periods of dry weather were apt to occur over a number of years?—If these periods follow in sequence, they ought to be called cycles.

37,406. I have heard meteorologists and other scientific men discuss this at length and I think we must take it as not proven?—The recent study of African rainfall has gone to show that the rainfall in the Abyssinian plateau and in the Sudan has a definite connection with the rainfall in India, and researches made by French investigators in the Sudan and in West Africa have shown that there is a steady diminution of rainfall in the Sudan; there is a gradual aridity arising in that part of the French possessions, and as that has a very intimate connection with the monsoonal character of the Indian rainfall, we expect to have more of these dry cycles, as I am calling them, in future.

37,407. I agree that changes in the character of the weather take place?—But when these changes follow a sequence, they have to be called cycles.

37,408. How did you arrive at the number of acres cultivated per pair of bullocks?—From conversation with peasants in the different districts.

37,409. You give a very low figure, four acres for a pair of bullocks?—In parts of this Province there is such great density of population that cattle cannot be maintained in large numbers and they have to be worked as much as possible; so that there is a great difference between the number of acres that can be ploughed by a pair of cattle in the Punjab and the number in a district like Benares.

37,410. The fact that it is difficult to maintain cattle makes it all the more important that they should plough as much as they are capable of ploughing; how much should a pair of cattle be able to cultivate?—I have said four acres, but they can cultivate ten acres.

37,411. What yould you suppose it would cost to keep a pair of cattle?—Now that irrigation is becoming more and more difficult as the water level is sinking more and more, there is a greater need of cattle power, and that at a time when there is no fodder, namely, in the dry season. In the dry season we want greater cattle power, and it is in that season that the cattle have much less food than in any other part of the year.

37,412. What does it cost a cultivator to maintain a pair of bullocks throughout the year? I have heard it stated that in the United Provinces it may cost Rs.200; but suppose we take it at Rs.100 (it would not be less than that). Then if the cultivator has four acres, it will cost him Rs.25 per acre to maintain his bullocks; that would mean that he would lose Rs.15 per acre on the four acres which he cultivates?—What is your point?

37,413. You made the statement that an ideal form of State landlordism would be one which would assure to the cultivator an adequate standard of living; have you ever deducted from the produce of the four acres holding the total paid in assessment, and asked whether the cultivator would then have an adequate standard of living?—No, in India it is decided quite the other way; you see there is a schedule of the expenses of cultivation. In that schedule the stock of agricultural debt is conveniently forgotten, the risks of agriculture are conveniently disregarded, the recurrence of dry cycles is also ignored, the cost of cultivation is placed on one side, the profits on the other, and then the assessment is fixed.

37,414. I was wondering whether you yourself had forgotten anything; you take the value of the four acres and deduct from that the total assessment payable on the four acres, which will be Rs.8 on four acres?—Yes.

37,415. Would the removal of the Rs.8 ensure to the cultivator an adequate subsistence if he is losing say Rs.15 on his bullocks, because he has got too small an area to cultivate? Have you compared the effect of being restricted to a very small holding as compared with the burden of the assessment which the cultivator pays?—In that part of my memorandum I do not say that it is the heavy assessment which is the greatest burden of the cultivator; my point in fixing that limit of three acres was this, that below that limit the holding ceases to maintain the family at all at the existing standard of living and comfort.

37,416. And even if he had that holding for nothing, he would not have an adequate standard of subsistence?—That is right.

37,417. *Professor Gangulee*: Has not the French author you refer to described what you speak of as weather cycles as periodicity of weather?—When periods of excess or deficiency of rainfall run in sequence, they become cycles.

37,418. I know that, but would not the facts rather suggest periodicity than a definite cycle? Hooker, as the result of his researches in England, finds periodicity of weather changes rather than definite cycles?—I do not quite follow what you mean; we have in India these cycles of heavy and deficient rainfall following in a periodic recurrence.

37,419. You are in favour of emigration, but would not emigration affect the so-called economic solidarity of the family of which you spoke?—The more adventurous sons of the cultivator would be going out to distant mines and plantations or overseas.

37,420. But would not that affect the so-called economic solidarity of the joint families?—When the money orders come to the villages the solidarity of the joint family would be all the stronger.

37,421. Is it your opinion that the number of landless agricultural labourers is increasing?—Yes, definitely.

37,422. Throughout this country?—Yes.

37,423. You have been telling us a great deal about the village panchayat and also about the village communal life; could you tell us how this village communal life could be revivified?—We must give more power to the village panchayats under the Village Self-Government Acts, and a large part of the organisation of agriculture might be left to them. For instance, the whole question of consolidation might be more easy of solution if the village panchayats could be utilised in this matter.

37,424. Do you think that village panchayats are sufficiently educated to be able to take the responsibilities of modern legislation?—Yes, for these agricultural purposes; in fact they have done so in a country like Japan.

37,425. *Sir Thomas Middleton*: There is one figure given on page 394 of which I doubt the accuracy. You say: "Annual farm hands get Rs.200 to Rs.250, and in addition four *kuros* of *juar* every month in Amraoti." Is there no mistake in this figure?—No; I think it is right. This is based on what I gathered as a result of a personal visit to a particular village myself.

37,426. *The Chairman*: Are you including the conditions of marketing in your surveys?—Yes.

37,427. Do you think that there is a great deal of work to be done in that direction?—Yes; I think we have to introduce co-operative sales wherever possible.

Dr. Radhakamal Mukherjee.

37,428. Do you think that detailed economic surveys in the field of marketing are necessary before you can frame your policy?—I think the data we have already are sufficient to lead us to the hope that co-operative sales would be very useful to the peasant everywhere. We have data regarding the organisation of such sales and the channels of marketing are also well known.

37,429. Have you investigated at all the margin upon which the various intermediaries in the chain of marketing and distribution operate?—Yes, we did some investigation work only a month ago in the Lucknow district and we found that 33 per cent. would represent the profits of the grain dealer in the particular village in which we investigated.

37,430. That is an investigation in one village only?—We hope to conduct similar investigations before long. It is of course in those parts of India where valuable money crops are grown that co-operative sale can prove more effective.

37,431. On this question of money crops there is one point that I would like to ask you. Would you like to say anything to the Commission as to the effect upon the economic welfare of the cultivator that the change over from food crops to money crops may have?—Where the money crop is grown as a result of the hypothecation of the grain dealer or moneylender, such a change would act unfavourably on the position of the cultivator; on the other hand, if the money crop is grown under conditions where the cultivator is still master of his own crop, then surely the money crop would be an advantage.

37,432. Assuming that the value of the money crop is greater than the value of the food crop, do you not think that it is also necessary if his lot is to be bettered that he should obtain the full cash value in the commodities that he requires?—Do you mean that the cultivator should grow food grains himself?

37,433. I mean that if he is to get the advantage of the increase brought about as a result of the change-over, plainly he must spend his money on the things of life that he desires; if he cannot obtain those things reasonably cheaply in his village, then, although he may be, on the face of things, better off in terms of cash he is not able, owing to his inability to buy well, to enjoy in the shape of commodities the advantage which he has earned?—But his labour will not be very profitable if he, for instance, continues to grow cotton in his own village garden or makes cloth out of cotton spun by his womenfolk, because he can get these things cheaper in the market.

37,434. But it is necessary, is it not, if he is to get the advantage of any improvement in his position in terms of cash, that he should be able to buy well; it is not merely a question of being able to sell his money crop well, it is also a question of his being able to spend his money to advantage? Have you studied that side of the problem?—I do not think that the cultivator is in danger of that. What we really have to do is to save him from the exploitation of the grain dealer rather than from the exploitation of the ordinary grocer or village shopkeeper.

37,435. You do not think that the one is as important as the other?—No.

37,436. Have you studied at all the price level of commodities in the ordinary Indian village?—Yes, there is a disparity between village and town prices; but that disparity cannot be compared with the enormous leakage of the profits of agriculture due to interception by the grain dealer, by the man who hypothecates the cultivator's crop.

37,437. Have you anything that you wish to say about the value of the export trade in agricultural produce to the cultivator? Do you attach importance to India's agricultural export trade?—Yes.

37,438. Have you studied the overseas markets in their relation to Indian produce?—Yes.

37,439. Is there anything in that field that you wish to put before the Commission?—I think that the cotton and jute markets abroad should be better organised than they are at present, and these should be linked to a federation of co-operative sale societies of cotton or jute which may be established.

37,440. Have you considered at all the possibility of fixing standards of quality for export?—Yes, if we can standardise our articles the market will be surer. We have to learn a great deal from the standardisation effected in Denmark, for instance.

37,441. And do you think that a raising in the estimate of the world's markets of the reputation of Indian produce would be of real service to the individual cultivator in India?—Yes.

(The witness withdrew.)

The Commission then adjourned till 2.30 p.m. on Wednesday, the 9th February, 1927, at Cawnpore.

Wednesday, February 9th, 1927.

CAWNPORE.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.

Raja Sir RAMPAL SINGH (*Co-opted Member.*)
Mr. J. A. MADAN, I.C.S. } (*Joint Secretaries.*)
Mr. F. W. H. SMITH. }

Mr. F. HOWARD VICK, M.I.Mech.E., Agricultural Engineer to Government, United Provinces.

Note on Irrigation.

Irrigation is very necessary for successful farming in Northern India since it gets practically all its rainfall condensed into about four months of the year, from mid-June to mid-October, the remaining eight months being nearly rainless. The most important and paying crops, such as wheat, barley, gram, &c., are grown entirely, from sowing to reaping, in the dry rainless season, and these all give a very poor return unless they get irrigation water from some source. Sugarcane, too, is sown in the dry season, and, generally speaking, to get any success and profit there must be irrigation between March and June. It is in these months that the foundations for a good cane crop are laid, and unless irrigated and well started in these dry months the crop will not make good in the rainy season.

I would, therefore, place irrigation as by far the first and most important need of agriculture. It is water, water, all the time, that the ryot and farmer is crying out for. If he can get the water in sufficient quantity, he will make good and his villages will be prosperous and fertile. On the other hand, without irrigation the ryot is poor, his village a wilderness and disease and semi-starvation his lot. If an example of this contrast were required, I would point to the generally prosperous villages of Rohilkhand where irrigation is comparatively cheap and easy, and parts of Muttra and Agra districts where irrigation is difficult and costly and the villages poor, half deserted, and barren.

There is, of course, a large area of land irrigated in the United Provinces, and in many other Provinces of India, by gravity flow from the many large canal systems. But there is a distinct limit to the area commanded by such canals and very few further large schemes await development since nearly all the large rivers have been, or are in the process of being tapped.

The remaining areas not so irrigated rely either entirely on the season's rainfall to carry them through the dry months of the year or partly on rainfall and supplemented by irrigation from wells, *jhils* and streams

It is instructive to analyse the areas of the United Provinces as regards irrigation or no irrigation. The total cropped area is about 35,000,000 acres, and this can be divided into three divisions:—

1. Flow irrigated area from canals and reservoirs.
2. Lift irrigated areas from wells, *jhils*, &c.
3. Area with no irrigation.

The totals of area of these three divisions are as follows:—

Classification.	Acres.	Percentage.
1. Canal irrigated	2,450,000	7
2. Irrigated from wells, &c.	7,350,000	21
3. No irrigation	25,200,000	72
Total cropped area	35,000,000	100

We thus see that although there are many big canals in the Province, only 7 per cent. of the total cropped area is irrigated from them. Also that only a further 21 per cent. of area is irrigated from wells, *jhils*, &c., and that the enormous proportion of no less than 72 per cent. is entirely without irrigation facilities at present.

Here lies great scope for the work of the engineer, a score of millions of acres or so in one Province alone producing about one-half to one-third of the crops it could produce simply for lack of irrigation water. It seems the very urgent duty of every Provincial Government and every Department of Agriculture to make a careful survey of the possibilities for irrigation by some means, within its respective Province and then get forward with some useful work in this direction if such work is found to be economically sound.

Speaking with a very wide knowledge of lift irrigation possibilities in the United Provinces, I am sure that great developments can be made here by lift methods from wells and bore holes. I have made many thousands of borings in the Province and I know the subsoil contains an absolutely inexhaustible water supply and mostly within very easy depths for lift irrigation. We have been working on earth borings and tube wells for the past fifteen years and have very fully proved the usefulness and economic soundness of such schemes. We can turn a well yielding 1,500 gallons per hour and irrigating five or ten acres into one giving 30,000 to 40,000 gallons per hour and irrigating and protecting 150 to 250 acres, by deep borings and the installation of water-lifting machinery.

It is a very urgent necessity for this Province's agriculture that lift irrigation be adopted on a very large scale. Money invested in such schemes could bring in a good return in the way of interest and the Province would be enormously benefited and enriched. The Province could also be placed outside the danger of drought or famine after a poor season's rainfall if such lift irrigation methods were adopted on a large scale.

The problem is how these lift irrigation schemes on very extensive lines can best be tackled. Up to now, in the United Provinces, we have been catering for one class mostly, the more prosperous zamindar and land-owner who has either money to pay for his schemes or extensive lands to mortgage to Government as security for a big loan. It is very necessary to go further and help the masses of the ryots who form the bulk of the agricultural classes and cultivate so great a proportion of the land under crops in this Province.

Since the ryot is, generally speaking, a poor man, without capital and without land to mortgage for loans, the only way to give him help in the way of irrigation would seem to be the formation of a Lift Irrigation Department on a large scale, something far bigger than even the present Canal Irrigation Departments. The schemes would be financed by Government and water sold and the money collected just as it is done in the Canal Irrigation Department. It would, perhaps, be possible to make lift irrigation a branch of canal irrigation, but there would then be the danger of neglecting and obscuring its importance. The Canal Department worked on lift irrigation by mechanical power for some years, about eighteen years ago, but failed to grasp its essential features through inexperience and imperfect knowledge of conditions existing underground and of suitable machinery for the work. Nothing was accomplished, therefore, at that time, nor until the Agricultural Department seriously took up agricultural engineering by the appointment of a permanent Agricultural Engineer in 1913.

The chief and, perhaps, the only difficulty in the way of very extensive schemes of lift irrigation is the financing of them. But there seems nothing impossible even in this, since huge sums of money are raised both in India and other parts of the world for large irrigation projects that promise a reasonable return of interest on capital. I think that Government should raise all necessary money by loans, just as they have done for new canal systems of irrigation.

Oral Evidence.

37,442. *The Chairman*: Mr. Vick, you are Agricultural Engineer to Government in the United Provinces?—Yes.

37,443. You have provided the Commission with a note of the evidence that you wish to give; would you like to add anything to your written evidence at this stage, or may we ask you one or two questions?—I do not think there is anything I wish to add.

37,444. Have you seen the memorandum provided for the Commission entitled "A Report on Agriculture in the United Provinces?"—Yes, I have seen the report prepared by this Province.

37,445. Would you give the Commission quite shortly an account of your own professional training and past appointments?—I was trained in England in mechanical engineering; I was a premium pupil with the firm of Sisson & Company, of Gloucester, and I was with them for about six years. I was also with a private firm of consulting engineers in England, Messrs Hampidge & Platt, and I came to India in 1897.

37,446. How long have you been in Government service?—I joined Government service in March 1899.

37,447. For how long have you been in charge of this particular branch of Government service?—I came permanently to the position of Agricultural Engineer in October 1913.

37,448. Would you give the Commission an account of the organisation of your sub-department in the Province; I think you have three or four circles?—The Province is divided into four circles each in charge of a Gazetted officer.

37,449. What staff has each of these Gazetted Officers at his disposal?—He has one first grade mechanic, two second grade mechanics, and as many fitters as there is work for; but actually the Government establishment is one mechanic first grade and two mechanics second grade; those are on the establishment; fitters are not on the establishment; they are paid for by the owners of wells.

37,450. These Circle staffs are augmented or diminished according to the amount of work to be done at any time?—Yes, they are.

37,451. What can each Circle undertake in terms of tube wells; how many tube wells could be constructed at the same time in each Circle by the same staff?—About twenty at a time in each Circle.

37,452. I think you are entirely separate from the Irrigation Department; you are part of the Agricultural Department?—Yes; I am a specialist officer of the Agricultural Department; I am not in the Agricultural Service.

37,453. But your budget is part of the agricultural budget?—Yes.

37,454. In your view is that a sound arrangement which divides canal irrigation from well irrigation?—No, it is not.

37,455. Would you like to see a change made?—In this Province, lift irrigation, if properly developed, will get too big for management by the Agricultural Department.

37,456. What do you suggest ought to be done?—It seems to me they ought to be combined now. I have got 126 tube wells in hand at the present moment of a value of about Rs. 10,00,000.

37,457. What exactly do you suggest: that your department should be linked to the Irrigation Department?—It is rather a difficult point to answer suddenly; it requires consideration.

37,458. Perhaps if you have not considered it before you would rather not answer now?—No. I should be quite willing to consider it and give you a further note on the point.

37,459. Yes, I think we should like to have a note and to have the argument which leads you to the particular view to which you come. There is a considerable disparity between the figures that you give on page 3 of your note as typed to show the percentage of land irrigated by canal, by wells, and land not irrigated at all; you say 2,450,000 acres are canal irrigated, while the figure mentioned in the memorandum is about 3,000,000? —It may be that some land is irrigated twice, and in reckoning the total irrigation done and the water rates collected some land might come in more than once.

37,460. That 3,000,000 itself does not include the 1,500,000 to 2,000,000 acres which it is estimated will be irrigated by the canals at present under construction?—No, it does not include that.

37,461. Is there any overlap between the canal irrigation and the irrigation from wells; is certain land commanded by canals also irrigated by wells?—Yes, very much so; in Meerut District for instance. As I say in my note, about 40 per cent. of a village is as a rule the maximum irrigated from canals, and I frequently put down tube wells in villages which are canal irrigated.

37,462. Does that show that the canal system is not capable of providing the cultivators with all the water that they require at all seasons of the year?—Not necessarily; it might be that the land is too high to be commanded by the canal to get the gravity flow; the higher land in the village might not be canal irrigated and it might require a tube well.

37,463. In some areas, where land is commanded by canal, water is not always available to the cultivator at all times of the year?—No.

37,464. And in such cases you have constructed tube wells to supplement the canal carried water?—Yes, I have.

37,465. I want a statement of the extent to which the Provincial Government is in fact subsidising the construction of tube wells. It has been stated before the Commission by other witnesses that in fact State assistance is provided in two forms: service free of charge, and in cases where the land irrigated by tube wells is to be used as an approved seed farm or for demonstration, there is I think a further subsidy in cash?—Yes.

37,466. Can you clear that up for us and tell us how the matter stands?—What is known as the grant-in-aid is usually Rs.2,000, if we want to cover a small plot for demonstration purposes.

37,467. That is Rs.2,000 given in cash for one well?—Yes, it is occasionally Rs.3,000; we will say it is Rs.2,000 to Rs.3,000.

37,468. And that is given after the agreement about the demonstration side of the work is signed?—Yes, there is an agreement for a demonstration plot or else for giving us seed; in some cases they give us seed.

37,469. Can you tell us to what percentage of the total wells sunk by your department this grant of Rs.2,000 to Rs.3,000 in cash applies?—Quite a small proportion; I should say 10 per cent.

37,470. Then quite apart from that, I think there is also a certain amount of help given in advice and service free of charge?—Yes, the whole of the staff are paid by Government from establishment, and that is not charged to the owners of the tube wells.

37,471. So that they get the technical advice and they get the actual work?—Yes.

37,472. And what does the cultivator pay for the material?—They pay for all the material, the engines, pipes and things used on the tube well.

37,473. And I presume they cart the material themselves?—Yes, generally they will then cart the material about.

37,474. Who pays for the unskilled labour?—They pay for it.

37,475. "They" being the cultivators?—The zamindar, the owner of the tube wells pays for the unskilled labour.

37,476. And that applies to every well constructed?—Yes.

37,477. Do you estimate at all what that assistance is worth in cash?—I have estimated that the cost of a big tube well with a 6 inch pump delivering 40,000 to 50,000 gallons an hour, at Rs.14,000, of which the zamindar pays about Rs.8,000; it is subsidised to the extent of about Rs.6,000.

37,478. Apart from that, zamindars may of course get indirect assistance in the shape of cheap interest on money through the *taccavi* loans?—I cannot say it is low interest; it is 7½ per cent.

37,479. That is not low interest, but I notice that Mr. Clarke in his note of evidence talks about assistance in the form of *taccavi* and grants-in-aid, the latter being I suppose the Rs.2,000 to Rs.3,000 grants?—Yes.

37,480. Do you think the zamindar could get his money cheaper elsewhere?—No, decidedly not.

37,481. Would he get it as cheaply from any other sources?—I think not.

37,482. So that, although it cannot be called cheap money, it is of assistance to the zamindar?—Yes.

37,483. Can you tell me if it is the case with these arrangements that you have been describing, that while they make it possible for substantial zamindars to construct tube wells, they hardly ever bring a well within the reach of the smaller men?—Yes, that is the case; we are working for the rich man.

37,484. I think I understand from your note that it is your suggestion that, until such time as the small man by combining with his neighbours is in a position financially to finance tube wells, Government should undertake the work, should sink tube wells in sets so as to cheapen pumping and should sell the water to the cultivator just as the Irrigation Department sells water carried by canals?—That seems the only way of solving the difficulty and getting at the small man.

37,485. That might even be the first stage to the ultimate taking over of the work by co-operative organisations?—Yes, provided the co-operative societies develop to any extent; at present they are weak.

37,486. Have you worked out at all the sort of area that you might irrigate by some such scheme as that which you have suggested, which is not likely to be irrigated under the present arrangements?—Yes, 75 per cent. of the Province is not irrigated at all and quite a large portion of it could be watered by lift irrigation.

37,487. You have got some 72 per cent. of the land of the Province which is not irrigated according to your figures, but I presume some of that will probably be irrigated as a result of your present arrangements, without Government undertaking any new responsibilities?—Yes, except that the scale on which we are now working is very small in proportion to the area of the Province.

37,488. What percentage of that 72 per cent. do you think is capable of being irrigated from tube wells?—Taking a rough figure I should put it at half.

37,489. Do you think that Government could recover in the shape of charges for the water the cost of constructing these tube wells?—I see no difficulty in that because the cultivator pays for the canal water at present; it would certainly be at a rather higher scale but I see no difficulty in it at all.

37,490. Do you think that the economics of tube well irrigation have been sufficiently studied in this Province or elsewhere in India?—No; there has not been any deep study into it.

37,491. I suppose the ideal conditions for such study would be at places where Government demonstration farms are irrigated from tube wells?—Yes, it would be a good opportunity for studying it. I have not got the staff myself for placing men on special work like that. Apart from the Government farm we are also working for the zamindar, and once the tube well is constructed we hand it over to the zamindar himself who provides his own driver, so that we have nothing further to do with it unless he gets into difficulties and he calls us up to set things right.

37,492. The Commission has been told that well water can only pay if the cultivation that it waters is of a high order and usually if the more valuable crops are irrigated? Would you agree with that?—Yes.

37,493. So that probably before Government undertake any large scheme you would suggest a very careful assessing of the costings of agriculture irrigated by water from wells?—Yes.

37,494. In the meantime is it the case that nothing of that sort is being carried out, at any rate by your department?—Yes, practically nothing.

37,495. *Professor Gangulee*: Not even in the case of the pumps that you have in the Government farms?—No; I can tell you what it would cost to lift the water and deliver it on the land or anything like that.

37,496. *Sir Ganga Ram*: We will divide this question into three heads: first, you bore wells in order to increase the output of water?—Yes.

37,497. Is that under you?—Yes.

37,498. From Mr. Clarke's evidence I gather that altogether you have done up to this time 38,056 feet in 673 wells and the cost has been Rs.2 per foot. What were the maximum and the minimum depths of boring that you did?—The maximum was 100 and the minimum 30 possibly. I think this average is probably quite right. But your figures are those for one year only. Altogether we have done more than 25,000 borings with a total of more than a million feet.

37,499. What size of tube did you put in?—2½ inch and some 4 inch.

37,500. What did you put at the bottom?—Nothing at all; they are open pipes.

37,501. Did you put any bell mouths?—No.

37,502. Do you not think that that method interferes with the velocity of the water coming in?—There is no velocity practically in a well where *charsa* working is done.

37,503. Do you not put concrete underneath?—No.

37,504. Do you put a strainer underneath?—Not in most cases.

37,505. Are these pipes of cast iron or wrought iron?—They are steel pipes I should say.

37,506. Do they work all right in these soils?—Yes.

37,507. Have you ever thought of the scheme of advising people to put *buchhas* or baby wells into the bigger ones; for instance if a well is ten feet, you can put in a seven feet well. That is how we do it in the Punjab?—We do not need that so much in this Province.

37,508. You are probably working entirely on sand; in certain parts of the Province we get similar conditions. Has that been tried in this Province?—Yes, the cultivators themselves are doing it on their own fields.

37,509. So much about boring wells: I now come to the ordinary wells. In the ordinary wells do you advise them where to stop? Do they come to you for advice?—Yes, we make test borings for ordinary *pucca* wells and we give them a sketch showing how deep they should sink their well cylinder.

37,510. You do not charge for that?—No.

37,511. With regard to tube-wells: how many kinds of tube-wells are there and what are their sizes? Is the least size two inches and a half?—Two inches.

37,512. And the next?—Four, five, seven, and nine inches.

37,513. Are these the only five sizes that you use here?—Yes; but we use the 2½ inches for *pucca* wells, for *charsa* working only.

37,514. That is the size of the strainer, and not the boring?—The boring of course would naturally be bigger. My standard boring for the big nine inch strainer is 15 inches; and the standard size in casing and boring pipes varies from 15 to 12, 8, 5 and 4. The strainer work is of course subsidised by the Government to a certain extent. I make my own strainers.

37,515. What strainers do you use?—Strainers of my own design.

37,516. You do not use the Brownlie strainer?—No. I do not use Brownlie strainers at all.

37,517. Have you invented one yourself?—I have designed one and am making that.

37,518. Is it your patent?—No, I have not patented it. At one time I used the Brownlie strainer.

37,519. I only know of three types: Brownlie's, Ashford's, and a new type now being made in Lahore?—There are at least fifty types; the United States are full of them.

37,520. Which of those in use here do you consider the best?—My own.

37,521. We have never heard of it in the Punjab?—You are coming to my workshops to-morrow, and can see it under manufacture.

37,522. Is it a copper strainer?—Yes.

37,523. What is the cost for each size of tube-well, using your own type?—For 2½-inch, Rs.5 per foot; for 4-inch, Rs.7 per foot; for 5-inch, Rs.9.8.0 per foot; for 7-inch, Rs.13 per foot, and for 9-inch, Rs.15 per foot.

37,524. Can you tell me the discharge from each?—That depends on the number of feet you put in the ground.

37,525. And also on the coarse sand you encounter?—Yes. With a 9-inch type, I am getting up to 60,000 gallons per hour, and occasionally up to 70,000 in certain cases.

37,526. When dealing with irrigation it is better to give the figures in cusecs?—For the big strainer the average would be 40,000 gallons an hour, or nearly two cusecs.

37,527. What would be the figure for the smallest?—The 2½-inch strainer is only used for bullock working; the others are chiefly used with power pumps. The maximum discharge would be, with the 2½-inch strainer, 4,000 gallons per hour.

37,528. And for the other sizes?—With the 4-inch, 10,000 to 12,000; with the 5-inch, about 16,000, and with the 7-inch, 25,000.

37,529. Who passes your estimates, the Director of Agriculture or the Minister?—Neither; neither is capable of scrutinising my estimates for technical work.

37,530. If you were linked to the Irrigation Department, there might be someone there who could check your estimates. Do you construct these things in your workshops or outside?—I do most of the work in my own workshop.

37,531. Is there a separate budget for your workshop?—Yes.

37,532. Do you show a profit?—No; I have been told by Government not to try to make a profit, but to help the zamindars.

37,533. Do you think an outside company could make them cheaper?—No.

37,534. I understand there is a company here which is making tube-wells?—They have attempted to.

37,535. Have they failed?—Yes, they have closed down that branch of their work. They had many failures; they never had anyone who understood the work.

37,536. I thought you were giving them advice?—They asked Government if I could join them, and Government refused. They approached Government without consulting me.

37,537. How many tube-wells have you sunk altogether?—We have made just over 25,000 borings for improving wells.

37,538. How many acres do you expect each size to irrigate?—The well with a 9-inch strainer is for a farm of 120 to 150 acres.

37,539. To make up for want of rainfall only?—No, it is for *rabi* irrigation; for sowing and continuing right through the *rabi*.

37,540. How many waterings?—The average is probably three for wheat and eight for sugarcane.

37,541. What is the cost per acre of supplying this water from tube-wells?—The actual running cost depends on the lift. With an average lift of 30 feet it would cost about Rs.2 per acre per watering.

37,542. For *rabi* it would be Rs.8 per acre?—Yes.

37,543. *Mr. Calvert*: Does that include interest and depreciation?—No; I was asked for the running costs.

37,544. *Sir Ganga Ram*: You put the running costs at Rs.8 per acre per *rabi*?—Yes.

37,545. Do you think the zamindars would pay that if you gave them water from tube-wells?—Certainly.

37,546. How much would you add for interest and depreciation? Another Rs. 2?—About that.

37,547. You advocate the creation of a Lift Department. Would you advise Government to undertake the work of supplying water from wells at Rs.10 per acre for *rabi*?—It could be done where the lift was easy. I am taking a 30-foot lift. The water would never be wholly for *rabi* but for sugarcane as well as *rabi*.

37,548. That will be about the maximum?—It is not easy to give a figure for a big thing like a Lift Irrigation Department.

37,549. The question is whether we should propose that these wells should be sunk and worked on a co-operative basis?—I think that should be done.

37,550. You say 75 per cent. of the land is not irrigated. According to evidence we have had before us as to the rate of progress now being made, it will take 400 years to bring this area up to the minimum required for obviating any risk of scarcity. What other means have you thought of for doing this?—Have you thought of any big canal scheme? According to my calculations, 10,000,000 acres must be brought under irrigation before this Province will be protected from famine?—I have never drawn up any big scheme, but from my tours round the Province I know there are many rivers and large *jhils* from which we could pump.

37,551. Has anything been done in that direction?—No, because there has not happened to be a zamindar in that area who could pay for the plant.

37,552. I am certain if you offered to supply them with water at Rs.10 an acre they would be only too glad to pay that?—Yes.

37,553. Is there no lift irrigation from canals here?—Very little; none by mechanical power. There are small areas irrigated by basket lift, and so on.

37,554. Do you not have a sort of Persian wheel for lifting?—Yes, but only to a very limited extent.

37,555. Do not the zamindars apply for that sort of thing?—The Irrigation Department has a lower rate for lift irrigation than that for flow irrigation.

37,556. But it is not taken up?—Not on any scale.

37,557. Because there is very little water in those months?—That is so.

37,558. Are you and the Agricultural Department under the same Minister?—Yes.

37,559. You only give canal water up to 40 per cent. of the area?—A village is supposed to be fully protected when 40 per cent. of the village area is given water.

37,560. But even that is not given?—Often it is not. It depends on the levels in the village.

37,561. Is there enough water to give it?—No.

37,562. Have you thought of any new schemes of increasing the canal water?—No.

37,563. Has the Irrigation Department not thought of any schemes for that purpose?—I do not think so. The Sarda Canal is probably the last of the big schemes in this Province.

37,564. But I want to know how you are going to get over the difficulty of dealing with 10 million acres which you want to irrigate in this Province?—It is only a question of finance. You can put in as many tube-wells as you want, provided money is found for them and their construction is economically sound.

37,565. That will not be a paying proposition. A tube-well on the average will command on the average only 10 acres, is it not?—It will command 250 acres.

37,566. With what size?—With 15-inch size boring and 9-inch strainer.

37,567. Of course, with that size it should command 800 acres according to our calculation. We give three cusecs per thousand acres out of which 500 acres are *rabi*?—It is all a question whether the man is using the water to the full advantage.

37,568. But if there is a scheme, a successful scheme, they will pay even Rs.10 an acre; the zamindars will pay double the rate of the Canal Department?—Yes; they will pay.

37,569. You have not thought of pumping a group of wells by compressed air?—No, because it is so inefficient. It is one of the most inefficient lifts in the world.

37,570. Have you tried it?—I know it; I have tested it. Thirty per cent. is about the maximum efficiency.

37,571. I know it is going to be made a paying proposition, because that is the only thing which can be done on a co-operative basis. Now we saw a tube-well in Benares and we were told it cost Rs.30,000; is that right?—The strainer that was first put in collapsed.

37,572. So it is the fault of the strainer?—Yes. It was a Brownlie strainer.

37,573. Is it a fact that it cost Rs.30,000?—I could not tell you off-hand; but it has been done twice.

37,574. I asked the driver there and he told me that the discharge was 15,000 gallons per hour?—It was 16,900 actually by measurement.

37,575. At that time it was not giving more than 5,000 gallons. It was commanding only 64 acres of land. Did you not think of a well of proper size which would be sufficient to irrigate that area?—The difficulty is that boring with a small size pipe is of no use. Benares is one of the worst places in the Province for tube-wells.

37,576. Have you got a section of that ground?—Yes; we passed a hundred feet of hard clay before we touched the water. (*The section was shown to the Commission.*)

37,577. You passed through very little of coarse sand?—Yes; it is a very bad place for boring.

37,578. Do you not bore first and then consider whether it is a proper place or not?—We do, of course.

37,579. *Professor Gangulee*: Have you trial borings?—No; I have given up trial borings because I know more or less the conditions in most of the tracts.

37,580. *Sir Thomas Middleton*: Could you tell us in a broad way for which areas in the United Provinces tube-wells are especially suited? You have mentioned Benares as an unsuitable area?—In a broad way the north of the Ganges is suitable and the south of the Ganges is poor.

37,581. Have you worked south of the Jumna at all, near Jhansi, for example?—No.

37,582. Why do you find the north of the Ganges suitable; is it because of the relatively small depth of clay through which you have to bore and the depth of sand which you can tap?—Yes, it is.

37,583. Do you find that there are large tracts in which the depth of the water is approximately uniform or does the depth vary much from village to village?—You find large tracts where the depths do not vary.

37,584. So that the water occurs in large basins in the sand through which you are boring?—The whole of the Province is one huge bed of sand with a certain number of floating beds of clay.

37,585. How deep have you bored?—The deepest boring I have seen made in this Province was 1,100 feet.

37,586. And you find sand right through?—Nothing but sand right down to the bottom, and I have heard it said by the Geological Department that probably the depth of the basin is four or five miles.

37,587. There is nothing of the artesian conditions here?—No; you could not get it under those conditions.

37,588. It is purely soakage?—Absolutely, yes.

37,589. Have your tube-wells generally been made in the cane-growing districts?—Yes.

37,590. Next to cane, which is the crop that has called for a tube-well by the zamindar?—The rotation crops with sugarcane, such as wheat and gram; but I do not think there are any tube-wells put down where there is no cane area at all.

37,591. You have no other sufficiently valuable crop to tempt the zaminder to ask for a tube-well?—No; because if he could get the tube-well he would at once grow cane. There are very few parts of the Province where he cannot grow cane if he can get the water.

37,592. In what areas is the growing of vegetables chiefly practised?—In areas close to the towns.

37,593. And close to the river beds?—Yes.

37,594. Wheat comes in as being a crop that is grown alongside cane?—Yes, as a rotation crop.

37,595. Can you tell us anything about the quality of the well water as compared with canal water? If a villager has his choice which would he prefer?—There is naturally more lime in well water than in canal water.

37,596. Is the difference known to the villager and is he anxious to have well water in preference to canal water?—No, because the canal water is cheaper and he will go in for the cheaper water if he can get it.

37,597. Is there much tobacco grown in the Province?—Not a great amount, but it is grown on patches of land near the village where it can be heavily manured.

37,597A. And irrigated by well water?—Yes.

37,598. Is there any district in which you have heard of water causing land to go salt?—Yes; Muttra and Agra probably. But it is mostly canal water, not well water, which causes these salts to appear in the top soil.

37,599. Can you distinguish between the danger from the water which comes from the shallow well and water which comes from the deep well?—The deeper the well the harder would the water generally be.

37,600. Have you any brackish wells in the Province?—Yes; in Agra and Muttra districts there are a lot. I have sometimes made borings in brackish wells and have struck a sweet spring down below and got sweet water. I have done that many times.

37,601. Have you heard of complaints about the quality of brackish shallow wells in your work?—No; I have never heard of complaints about the water.

37,602. *Sir Ganga Ram*: Do you not get different kinds of water, first brackish and then sweet?—Yes.

37,603. *Sir Thomas Middleton*: I should think that would be one of the main reasons for asking for tube-wells; if the surface wells are brackish, would not the villagers ask for tube-wells in order to get sweet water?—I should not think 5 per cent. of the wells in this Province are brackish.

Then it is not a serious problem with you.

37,604. *Sir James MacKenna*: Do you think the Agricultural Engineer should be a member of the Indian Agricultural Service, of the Irrigation

Department, of the Public Works Department, or of a separate service?—There are not enough Agricultural Engineers to make a separate service at present.

37,605. Under what section of the administration do you think you should come?—As long as we work under the Agricultural Department we should be in the Indian Agricultural Service.

37,606. On the same footing as members of the service in other branches?—Yes, we should be, provided we have the requisite training.

37,607. What training do you think is the most suitable for an engineer devoting his time to agricultural engineering?—It is very practical work; a great deal of it has to do with the erection of machinery, and I should say they should have college education and at least two or three years' practical workshop experience.

37,608. Should they hold the degree of B.Sc. in civil engineering or mechanical engineering?—They should hold the B.Sc. in engineering, provided they had two or three years at least in the workshop.

37,609. That is the sort of man you would recruit?—Yes.

67,610. *Professor Gangulee*: Is your section of the department concerned with the problem of agricultural implements such as ploughs and harrows?—No, agricultural implements of that kind are mostly dealt with by Deputy Directors. I make a lot in my workshops for the Deputy Directors, but I do not recommend any particular plough to the cultivator; I leave that to the Deputy Directors.

37,611. Does the Deputy Director design the implements?—No, generally they are not designed by the Deputy Director. The Meston plough was designed in my workshops, but before I joined the Department. The Meston plough is very cheap, and that is the implement which we sell mostly.

37,612. Who is responsible for the improved ploughs and improved machineries about which we hear so much? I was wondering whether the Agricultural Engineering Department has anything to do with agricultural implements?—The Meston plough was designed and made by a *mistri* of the engineering workshop, I believe. I do not know of any other plough or implement made by the Department in quantity.

37,613. Is it done by the Deputy Director in your workshop?—I make some tools and implements for them, but they get a lot of implements and machines from private firms. I probably make quite a small proportion of what they sell.

37,614. Do they obtain supplies of implements from the manufacturers?—Yes, they sell quite a lot of Ransome's small ploughs.

37,615. There is no indigenous manufacture here?—I do not think there is in this Province.

37,616. So, you are chiefly concerned with the pumps and tube wells?—Yes, anything to do with mechanical power; I leave the recommending of smaller implements to the Deputy Directors.

37,617. You tell us in your statement that 21 per cent. of the total acreage is under irrigation from wells. Could you tell us what is the percentage for tube wells?—I could not tell you, but it is very, very small; we are only touching the fringe even on the scale on which we are working now. It is something far less than 1 per cent.

37,618. We are told there is a tendency for the area under well irrigation to diminish; is that so?—I could not give you a definite answer to that.

37,619. You tell us you have got 200 tube wells with engines and pumps complete and that you have 55 more in course of construction; how many of those 200 tube wells belong to the Government and how many to the people, the zamindars and so on?—I should think about 5 per cent. belong to the Government and the rest to zamindars.

37,620. The percentage belonging to the zamindars is as high as that, is it?—Yes, it is only on a few Government demonstration farms that we have tube wells belonging to Government; practically all the work I do I am doing for the private individual, the zamindar.

37,621. When you say orders are continually coming in, you are referring to orders from the zamindars?—Yes.

37,622. Do you require any advance of the price when you take the order?—I take the whole price in advance; I do not start a well until I have the whole of the money in my hands.

37,623. Then how long does it take you to execute the order for which you have already realised the price?—It depends upon the difficulty of the boring; some borings are very much more difficult than others; in some cases it will take a year or eighteen months, if we encounter great difficulties and have a broken pipe. There is a very great wear and tear on boring tools. My staff is comparatively small at present in view of the increase in the work.

37,624. So that in order to meet the demand which your figures indicate, you require more staff?—Yes.

37,625. How many unsuccessful borings have you had?—It is a very small percentage in this Province; conditions are probably better in this Province than in any other Province in India.

37,626. Have you worked out the economical pumping unit?—You may take it in this way, that the bigger the pumping unit the less the cost will be for irrigation per unit area; you get cheaper water from a big unit than from a small one.

37,627. From your statement as well as from the provincial memorandum I have the impression that you have succeeded in making tube wells quite popular in this Province?—Yes.

37,628. How is it, then, that your success in the construction of tube wells has not led commercial firms to take it up on a commercial basis; if it is paying and the orders are pouring in from the zamindars, why do not commercial firms take it up?—But, as I pointed out to the Chairman, it is subsidised by Government; the zamindar is not going to pay Rs.14,000 to a private firm while he can get it for Rs.8,000 and have a subsidy of Rs.6,000 from Government.

37,629. So that if you removed the subsidy the popularity might cease?—Yes, it would for a time until they began to see that it might even pay them at the price of Rs.14,000.

37,630. How long do you think this subsidy will have to be continued? Surely Government is not in a position to subsidise the landlords eternally? —That is a point for Government to decide; I should not like to speak on the point.

37,631. How long do you think it would take before the commercial firms may be in a position to take it up?—I should not like to answer the question.

37,632. Do you know any commercial firm who have undertaken this work?—Yes, the Empire Engineering Company used to do tube wells a little while ago, but I believe they have given it up because they could not get any success.

37,633. Do you attribute their failure principally to the fact that they could not get orders from the zamindars?—No, not altogether due to that; it was because they made so many failures.

37,634. It was due to lack of efficiency?—Yes.

37,635. Given the necessary efficiency, do you think any private commercial firm could make it a success?—Government would have to subsidise it at first, and then gradually reduce the subsidy until it disappeared; that is the only way.

37,636. Are you reducing your subsidy now?—No.

37,637. *Mr. Calvert*: With regard to this question of the subsoil water being inexhaustible, you have, of course, heard of the theory that there is a buried mountain range parallel with the Himalayas which runs through this Province?—Yes, I have heard that opinion expressed.

37,638. That mountain range is supposed to have led to a decline in the water level in certain tracts of the Punjab?—Yes.

37,639. Do you come across any traces of a similar phenomenon here?—No, the water level in this Province has generally gone up by about 10 feet in the last six years.

37,640. There are no complaints of the water level dropping?—No, the water level has gone up 10 feet in the last six years.

37,641. So that as far as that is concerned, you do not anticipate any obstacle to the extension of these tube wells?—I see absolutely no limit to it.

37,642. Could you give an all-in figure of the cost of one of these 9-inch strainer tube wells?—Rs.8,000 to Rs.8,500; that is without the subsidy of Government; the actual cost is Rs.14,000.

37,643. And that with a 30-feet lift would irrigate about 150 acres?—Yes, and protect 250.

37,644. I think you told Sir Ganga Ram that these tube wells were mainly intended for *rabi* irrigation; but must not they be worked all the year round to make them really economical?—We get such a good rainfall that we do not want them in the *kharif* except once in ten to fifteen years when there is a failure of the rains.

37,645. That throws all your capital charges on to the *rabi* irrigation?—Yes.

37,646. For ordinary bullock well irrigation in this Province would you say the cost was round about Rs.20 an acre?—No, it does not cost that.

37,647. What is the capital cost *plus* the recurring cost?—I should imagine that Rs.15 would be an outside figure for it. You must know that we have got very easy lifts in quite a large proportion of the Province; in some cases the water is not more than 10 feet down.

37,648. I want to get the comparative costs of irrigation by the tube well and the ordinary bullock well. At what point does a tube well become economic in preference to a bullock well?—The tube well is more economical at any point up to 50 feet, provided there is sufficient area for irrigation; after that they are both uneconomic. 50 feet is the outside limit; it then begins to get past the economic line for pumping for ordinary *rabi* crops.

37,649. Up to 50 feet the tube well is more economical than the bullock power well at every level?—Yes.

37,650. Provided you have sufficient area to employ your power plant for a certain number of months a year?—Yes.

37,651. In your estimate for the costs of tube well irrigation you did not take into consideration any enhancement of land revenue on the wet land, did you?—Land revenue is a subject into which I have not gone deeply; but, of course, the only way to get increased revenue would be at re-settlements; it could not be changed at any other time.

37,652. On canal lands Government gets a water rate, and then it gets a wet assessment?—Yes.

37,653. In your calculations as to the cost of tube wells you have not reckoned the advantage to be gained in the enhanced land revenue?—No, I have not reckoned that in; I have reckoned the actual cost of the tube well. Of course, there is something coming back to Government in the way of revenue and increased re-settlements on a village becoming irrigated instead of unirrigated.

37,654. You are rather inclined to recommend a big department which would sink these tube wells and recoup itself from a water rate?—That is done by the Irrigation branch. The capital cost is given by Government provided they get a reasonable interest on the capital cost by the working of the canals.

37,655. Have you made any calculations as to the advantage of tube wells sunk by Government under the system which you recommend and those sunk by a cultivator at his own expense, because in the second case he gets the remission of the wet assessment for the full period of settlement, say, 30 years? In a parallel case in the Punjab the calculations which were worked out showed that it would not pay the cultivator for Government to bear the whole of the initial expenditure?—Conditions are much easier in this Province than they are in the Punjab.

37,656. *Sir Henry Lawrence*: In what way?—Our water level is often in large tracts between 10 and 20 feet, and I think Sir Ganga Ram said that a lot of the Punjab level was 50 to 70 feet.

37,657. *Mr. Calvert*: Is the big central power station referred to in the printed note approaching completion?—Eight of the ten tube wells are being completed.

37,658. And, so far, there has been no hitch of any kind?—No.

37,659. And it promises to be quite successful financially?—Yes.

37,660. *Sir Henry Lawrence*: You said just now that the zamindar would have to pay some income tax if he used the tube well?—I only said that if he uses the tube well and he makes a bigger profit on sugar making and selling, naturally he would have to pay more income tax. As a matter of fact, in all my sugar areas I put down crushing mills for crushing the cane and boiling plant and centrifugal machines for making white sugar; in fact, the tube wells cover flour mills and oil mills and other plant besides the pump which is worked by the same engine. So that we are introducing industries as well as irrigation.

37,661. The income tax would be on his industrial revenues and not on his agricultural revenues, I take it?—Yes, that is so.

37,662. *Sir Ganga Ram*: Are all the tube wells made by you or are they made by any contractor companies here? In the Punjab there are no less than five or six firms who do this work?—I believe there is a company which was recently started under the name of "The Agra Tube Well Company," and there is also another company in Meerut who call themselves "The Reliable Water Company."

37,663. Do they have to take your permission before they undertake to put up any tube wells?—No.

37,664. They can do the work independently?—Yes.

37,665. Have you ever called for tenders from any of the Punjab contractors for the cost of putting up a tube well?—I have given actual orders for some of my tube wells to the Empire Engineering Company. We have never called for tenders from any Punjab firms.

37,666. Then, for your information only, I might mention that we are doing the work for just half the cost mentioned by you just now?—What are you reckoning on?

37,667. I have completed two tube wells very recently in my Province: the 5-inch one cost me Rs.8,000 and the 4-inch one cost me Rs.3,000. We went about 200 feet below the ground level?—If the 5-inch one cost you Rs.8,000, my price for the same is Rs.5,000.

37,668. I am afraid I must have misunderstood you?—Yes, you have: my outside price with the Government subsidy and everything else is Rs.14,000 with the big size, 15-inch boring and a 9-inch strainer.

37,669. What did you say your 2½-inch tube well cost you?—About Rs.1,000.

37,670. And the 4-inch?—About Rs.2,000, because it gets an engine with it. All my prices include engine, machinery, etc., handed over complete and running.

37,671. But excluding the engine what would be the cost?—It would cost about Rs.4,000 for the 9-inch size.

37,672. That does not include any subsidy?—No.

37,673. How much for the 7-inch size?—For the 7-inch size the cost would be about Rs.3,000, without the engine and the pump.

37,674. And for the 5-inch?—Rs.1,500. As I say, all the prices I gave before were reckoned on complete tube wells, pumpings, engine, all finished off and handed over.

37,675. When you start these tube wells, how much does the water go down? What is the head you reckon upon?—You mean what is the depression on the pumping? It is about 20 feet. I usually work on that basis.

37,676. Are you still using centrifugal pans for whitening the sugar; I thought that had proved a failure?—Not a bit of it; I was in a village the other day, which I believe the Commission will be visiting, and I found twelve centrifugal machines being used there alone for making white sugar.

37,677. From *rab*?—Yes.

37,678. *Sir Thomas Middleton*: It would help us very much if you could give us some estimates for particular conditions which I will indicate? If you take the average conditions of the district in which you are going to bore, and assume that we have (1) a small unit of 20 acres, growing 5 acres of sugarcane; (2) a large unit of 200 acres, growing 50 acres of sugarcane; and (3) lifts of 20, 30 and 40 feet, we would like you to estimate the cost of delivering water?—Per thousand gallons or per unit area, or what?

37,679. I have given you the units so that you may estimate the quantity of water that would be required for 5 acres of sugarcane with 15 acres of *rabi* in this district?—Very well; would you like to know the cost of delivering water in each case?

37,680. Yes; also your cost of installation and your estimate of the cost of supplying the water. You might specify the conditions which you have shown us in your drawings, (1) a very favourable set of conditions for a well, (2) unfavourable conditions, state also the depth to which you assume you will have to bore?—Very well.

37,681. *The Chairman*: Can you give us any indication of the saving effected by grouping wells under one prime mover?—It would be rather difficult to give an estimate of that. It is an engineering point that the bigger the unit the cheaper would be the power per H.P. hour, and I am not quite sure on that point that by working on a 100 horse-power unit lifting water at a certain depth, we would be getting water far more cheaply than by working on 10, 15 or 20 horse-power set at the same depths. But I can work it out for you at any particular head?

37,682. Do please? Would 30 per cent. be a reasonable estimate, do you think?—I think it would be.

37,683. Have you the time and the staff to make any investigations into the other branches of agricultural engineering?—What particular phase of the Agricultural Department work are you referring to?

37,684. How wide is your responsibility in the engineering line of your department? Can you devote attention to experiments with agricultural implements?—Yes, if there was a call for them. I should probably have to engage extra staff, but that would not be a difficulty, since Government is very liberal in the matter of funds and staff.

37,685. You think it is a reasonable arrangement that that work should come under the officer in charge of the engineering section?—Yes, I think it should be under him.

37,686. *Sir Ganga Ram*: Do you find your copper strainers suffer from galvanic action?—No, not to the same extent as they do in the Punjab. Probably the Punjab water sets up more galvanic action than ours.

37,687. For how long have the oldest of yours been working?—About twelve years.

37,688. They show no sign of corrosion?—No, although I have had one case where corrosion occurred after three years.

37,689. Is not sand blown in?—Yes, once corrosion takes place sand is blown in and spoils the well.

37,690. *Professor Gangulee*: Did you say there was no call at present for experiments with agricultural implements?—No, I did not say anything so broad as that; my point was, there was no call for the implements themselves from the zamindars.

(The witness withdrew.)

The Commission then adjourned till 2.30 p.m. on Thursday, the 10th February, 1927.

Thursday, February 10th, 1927.

CAWNPORE.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Raja Sir RAMPAL SINGH (*Co-opted Member*).

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries*).

Mr. C. H. PARR, B.Sc., I.A.S., Deputy Director of Agriculture, in charge of cattle breeding operations, United Provinces.

Replies to the Questionnaire.

QUESTION 16 (*a*) (i).—ANIMAL HUSBANDRY.—For the purpose of considering the breeds and types of cattle the United Provinces may be conveniently divided into five tracts, viz.:—

(1) Dry Western tract.

(2) The Submontane tract.

(3) The Central humid tract.

(4) Bundelkhand.

(5) The hills.

(1) The dry Western tract, includes the whole of the country to the west of the Ganges between Cawnpore and Saharanpur. The normal rainfall of this tract varies from 23 to 32 inches.

(2) The Submontane tract, comprises an area, about 30 to 40 miles broad, bounded on the north-east by the foot hills of the Himalayas and the Nepal Tarai, and stretching from Saharanpur to Gorakhpur. Normal rainfall varies from 35 to 50 inches.

(3) The Central humid tract, consisting of the remainder of the Province with the exception of the Bundelkhand. Normal rainfall varies from 35 to 45 inches.

(4) Bundelkhand. Normal rainfall varies from 31 to 37 inches.

(5) Hills.

Cattle.

Recognised breeds, or types.	Distribution.	Type and general characteristics.
Hariana ...	Found in small numbers in districts of the dry Western tract, mixed with cattle of the Mehwati and smaller type. Bullocks of this breed are used by the wealthier cultivators throughout the dry Western tract and to some extent in the Central humid tract.	Dual purpose, heavy draft.
Mehwati ...	Found in western districts, chiefly those bordering the Rajputana States, in which districts are also found the cattle of the Hariana breed and smaller type. Bullocks of this breed are in general use with cultivators of the western districts, and are to be found in large numbers in the Central humid tract.	Dual purpose, medium draft.
Kherigarh ...	Distributed in eastern and north-eastern districts, and generally throughout the Submontane tract, the chief breeding-grounds being in Kheri and other neighbouring districts. Bullocks of this type are in general use with cultivators of the eastern and north-eastern districts and also in the Central humid tract.	Light draft.
Ponwar ...	Found in north-eastern districts of the Submontane tract and Central humid tract. Chief breeding-grounds are in the district of Pilibhit and neighbouring districts.	Light draft.
Kenwaria ...	Found in southern Bundelkhand	Light draft.
Hill cattle ...	Hill districts. Hill cattle are very small. A mixed and ill-defined type. Almora, Garhwal and Naini Tal.	
	Buffaloes.	
(1) Murrah ...	Distributed in dry Western tract together with buffaloes of the *deshi* type.	
(2) Deshi ...	Distributed in the remainder of the Province.	

To enable improvement to be effected in the various types and breeds it is necessary at the outset to establish pedigree herds of each type. From the male progeny of these herds suitable stud bulls will be selected and distributed to approved breeders for grading up their own cattle. The only agency by which large pedigree herds can be established at present is Government. As the bulk of the cattle-breeders of these Provinces own only a few head of cattle and as far as their cattle and as well as their land are concerned are smallholders, measures which aim at cattle improvement must be adapted to dealing with the question generally from smallholders' point of view.

At present there are two Government breeding farms on which are established herds of the following breeds:—Hariana (Hissar), Kherigarh, Murrah buffaloes, and Sahiwals.

Farm.	Area.	Breeds of the established herds and number.
Madurikund, Muttra district.	613 acres	Hissar (Hariana) 376.
	This year an addition of 782 acres has been made to this area.	Murrah buffaloes 125.
Manjhra, Lakhimpur, district, Kheri.	553 acres. An addition of 2,000 acres to this farm is under consideration.	Kherigarh 127. Murrah buffaloes 103 and Sahiwal 108.

In order to preserve and improve the other breeds pedigree herds should be established, and to do this the following breeding farms are necessary:—

(1) *Mehwati breed.*—A breeding farm for the Mehwati breed situated some where in or near the dry Western tract. The cows of this breed possess considerable milk capacity, and the bullocks are good draft animals of the medium heavy type and are very popular with the cultivators of the Western districts. The breed offers, therefore, very good material from which may be built up a dual purpose type, suitable for the conditions of the Province. The breed is widely distributed in the Indian States, of Bharatpur, Alwar, and other neighbouring States. It requires preservation in the Province of Agra, for which it seems particularly suited. No time should be lost in establishing the farm and a herd for this purpose. The bulls produced from this herd will prove valuable for grading up the local cattle of many districts of the Humid tract, and will without doubt be in great demand in the dry Western tract.

(2) *Ponwar breed.*—This attractive breed of black and white cattle supplies a draft bullock slightly heavier and slightly less active than the Kherigarh. Hitherto no arrangements have been made for establishing a pedigree herd of this breed. Proposals are now under consideration for the extension of the Manjhra cattle-breeding farm to enable a herd to be established on that farm. Furthermore, it is proposed to take over grazing areas (grazing *bachailas*) in several districts in submontane tracts for the purpose of establishing pedigree herds of the Ponwar breed and another herd of the Kherigarh breed. Both the Kherigarh and the Ponwar are exceedingly hardy animals, and the grazing which these *bachailas* will provide, supplemented by a little cultivated fodder crop, will enable large herds to be established at various centres, from which breeding bulls can be conveniently issued to breeders who are in urgent need of them.

(3) *Kenwaria.*—A proposal is under consideration for the establishment of a cattle-breeding farm in Bundelkhand for the purpose of studying the special cattle-breeding problems of this particular tract and for the establishment of a pedigree herd of the Kenwaria breed and of buffaloes acclimatised to Bundelkhand conditions. As a result of the gradually increasing value of the livestock in these Provinces, Bundelkhand cultivators and cattle-breeders are becoming more interested in cattle improvement, and there is no doubt that the Bundelkhand offers a very wide field for cattle improvement and that cattle owners will welcome any assistance to this end.

(4) *Sahiwal.*—The Sahiwal breed is not indigenous to these Provinces. Cattle of this breed have been imported for dairy purposes from the Punjab and are used by city dairymen for the production of milk. On account of

their sluggish nature bullocks of the breed are not popular with the cultivators of the dry Western tract (where the breed is at present mostly distributed) who prefer animals of more active type. The breed, however, unlike some of the other breeds abovementioned, possess considerable power of acclimatisation and in consequence appears to be widely distributed throughout India and numbers have been exported with success to the Near East. The herd at the Manjhra farm, therefore, was established with the object of investigating the capacity of this breed to stand the trying conditions of the Eastern and Tarai districts, where no animals of milk capacity exist and in which districts milch animals of imported breeds, whether cows or buffaloes, quickly deteriorate. The results so far obtained are very hopeful and the Sahiwal herd has proved itself capable of thriving and withstanding these conditions much better than the imported Murrah buffaloes, and the possibilities of this breed as a milch animal for these conditions are worthy of further investigation.

Since crop production brings in a better return than cattle-breeding, the attention of enlightened zamindars and others, who have, in recent years, begun to take a practical interest in agriculture, is attracted more to crop production than to cattle-breeding. Some time is likely to elapse before zamindars will be induced to establish large cattle-breeding farms and maintain pedigree herds on their own account. As already pointed out, if any progress is to be made in cattle improvement in the near future, it will be necessary for Government to establish farms and build up pedigree herds to supply the bulls necessary for effecting improvement in the district. By this it is not meant that all the bulls necessary will be supplied by Government. The bulls produced on the Government cattle-breeding farms should be utilised in such a way as to ensure that the improved qualities which they inherit and carry from the pedigree herds will not be lost when they are distributed to the breeders of the district. In order to ensure this, a system of controlled breeding areas has already been started. Two such controlled areas were started in 1923, (1) Muttra district, (2) Etawah district, in which efforts have been made to concentrate the best bulls produced on the Government farms with the object of maintaining touch with their progeny from selected cows. The male progeny of these bulls and selected cows are being reserved for purchase by this department for re-issue as breeding bulls to other districts in which the standard of the cows is not so good. These two controlled breeding areas have been organised in connexion with the Hissar (Hariana) breed of cows and the Murrah breed of buffaloes. With regard to other breeds no controlled breeding areas have yet been started. The organisation of the controlled breeding areas marked a turning point in the progress of cattle-breeding operations in these Provinces. Up to that time practically all the bulls of the Government farms were issued to District Boards, who again distributed them to approved zamindars. The District Boards contributed a portion of the cost of the maintenance of each breeding bull and the remainder was provided by the zamindar with whom the bull was located. This system, started by the Civil Veterinary Department, enabled that department to distribute a number of bulls and, to a certain extent, popularise them. The system, however, on the other hand, had defects and the following are some of them:—

(1) The financial position of the Boards allowed the Boards to maintain only a few bulls.

(2) Zamindars with whom the bulls were located, often showed little interest in the bulls, occasionally were reported to have appropriated the money contributed by the Board, and to have left the bulls to maintain themselves as best as they could.

(3) Bulls were often lost and the conditions of those inspected was seldom reported on well by Cattle Inspectors, and the wide distribution of bulls throughout the Province made their inspections very expensive, and any control practically an impossibility.

The organisation of the controlled breeding areas have proved (1) that good bulls are urgently required; (2) that village cattle owners are willing to subscribe and contribute towards their initial cost; (3) that village cattle owners and cultivators are willing to maintain them without any outside assistance; and (4) that, contrary to general opinion, village cattle owners are not apathetic to cattle improvement, but show a genuine desire to make the best possible use, as far as their knowledge and their economical condition allows, of the means put at their disposal for improving their cattle.

The organisation of one or more controlled breeding areas in suitable districts in connexion with each breed, stud bulls of which are being issued, is the next step indicated by experience so far gained. Such organisation ensures that the bulls bred on the Government breeding farms are utilised to their full extent. Some such organisation is necessary to supply the large number of bulls which are required in every district.

The cost of a controlled breeding area need not become a large sum. Cattle owners in the controlled breeding areas are now contributing towards the initial cost of the bulls, which they are taking now at 18 months or two years of age and which they are rearing in their villages. An experiment is being tried in the Muttra controlled breeding area of the possible use of *taccavi*, and a sum of Rs.40,000 has been put at the disposal of this section for this purpose. It is proposed to issue to the Muttra district young bulls to the value of this amount against the security of the villagers, who will repay the amount to Government plus 7½ per cent. interest. Judging from the manner in which the cattle owners have contributed towards the initial cost of the bulls under the previous scheme, it appears likely that the *taccavi* system will be highly acceptable to them. If this is the case, the combined use of controlled breeding areas to raise the bulls and *taccavi* loan as a means of purchasing and distributing them should, in the long run, be productive of very appreciable improvement and at very small cost to Government, beyond the pay of the staff engaged in working the scheme.

District Boards and non-official agencies. — Although the maintenance scheme, already referred to, whereby bulls were issued to the District Boards, has, except in a few districts, fallen into abeyance, efforts have been made to encourage District Boards to take an active part in cattle-breeding scheme and in the supply of bulls to breeders of their particular districts. Small grants have been made by the Board of Agriculture to Agricultural Sub-committees of the District Boards for the purchase of bulls, and several District Boards have decided to contribute from their own funds for this purpose. The Cawnpore District Board recently subscribed Rs.10,000 from its own funds and has supplied on easy terms 100 cows of Hariana breed to zamindars of the district. The Board has indented on this department for stud bulls, and the cows recently purchased are being located in the vicinity of the stud bulls supplied by this department. The Moradabad District Board has under consideration a scheme for allotting an equally large sum from its own funds for a similar purpose. It will be seen that these Boards are becoming alive to the importance of cattle improvement, and are beginning to realise the active part which it is possible for them to take. "Example is a lesson that all men can read." The organisation by this department of controlled breeding areas in different parts of the Province will do much to stimulate non-official interest in cattle improvement, and these areas under proper

control will, in a short time, be in a position to supply in a large measure the breeding bulls which will be indented for by District Boards who take up cattle-improvement schemes.

(ii) The two chief products of the dairying industry are—(1) Milk, and (2) *Ghi*.

(1) *Milk*.—There is a general impression that the supply of milk in the United Provinces is deficient. Actually the potential milk capacity of these Provinces is greater than the purchasing capacity of consumers. The cost of the production of milk, even in remote villages, puts it beyond the purchasing capacity of the average cultivator and agricultural labourer and the market for milk as such is, therefore, restricted to that of the more wealthy city consumer. As most village milk producers outside a radius of eight miles of towns and cities are unable to make use of the city or town markets, they adopt the less profitable practice of converting the milk into *ghi*, which is sold as such, and of utilising the by-products of this conversion for home consumption. The main milk consuming portion of the population, therefore, is dependent on a very small area for its supply of milk, and in consequence suffers from a deficient and expensive supply, the production of which is, in the main, in the hands of certain communities, namely, *ghosis* and *gowalas*. These practically monopolise the sale of milk both to consumers and to middlemen, the chief of which are *halwais*. Herds of considerable size are maintained both in the towns and cities themselves, and in their immediate vicinity. As practically all the fodder which these herds consume is purchased, the cost of their maintenance and of the milk production is very high. Adulteration is generally practised by *ghosis* and *gowalas* and the general conditions and methods of handling the milk are altogether insanitary, and the general outcome of these conditions is a supply of milk which is expensive, usually adulterated and seldom clean. In view of the monopoly which the above communities hold in regard to milk supply, it is not surprising that efforts to improve their position and methods have not been greatly welcomed by them.

Suggested Remedies.—(1) *Collecting agencies*.—The organisation of collecting, transporting and distributing agencies by men of position and standing, which will arrange for the collection of milk from village producers living at distant villages, its transport, under hygienic conditions to the city market, and its proper distribution under sanitary conditions to the consuming public.

(2) *Legislation*.—A Foods Adulteration Act, by which the sale of milk and dairy products will be controlled. Such control will enable agencies as those mentioned above to develop their business on sound and honest lines in face of the monopoly at present held by *ghosis* and *gowalas*, and will give the consuming public more confidence than they at present have in milk and dairy products, and will thereby increase and encourage the consumption of these valuable articles of food.

(3) *Transport Facilities*.—A better supply of roads, both *katcha* and *pucca* kept in such a condition as to facilitate the quick passage of light vehicles between villages and towns to enable the village milk to be freely drawn upon for town consumption. The provision of refrigerating cars or suitable milk vans on railways to enable the railways to be utilised as a means of transport of milk and dairy products.

By such provision milk production will be greatly encouraged in the main breeding tracts as, for instance, in the breeding and cattle-raising tracts of the Terai and submontane tract on the east and north-eastern districts. If the above facilities are provided it is possible that a state of over-production will sooner or later be reached to provide for which the possibilities of markets outside India should be investigated, for instance, Burma and

the Near East as markets for butter. The utilisation of these markets will necessitate the provision of cold storage accommodation at the main ports and also on the vessels carrying dairy products to these countries.

Although the milk capacity of the so-called milking breeds of both cows and buffaloes is, even amongst the best, not high and decidedly low, amongst those breeds of the north-eastern and eastern districts of the Province there is no doubt that if it were possible for a village cattle owner to obtain somewhere near the price for milk which the town consumer is willing to pay, he would make it his business to improve his stock by careful breeding and management or, failing that, to obtain cattle, either cows or buffaloes, from other districts which are capable of producing milk. So long as milk production is a source only of very small profits, the average cultivator finds his land a better investment for his surplus capital.

Ghi.—The bulk of the milk produced in these Provinces is converted into *ghi*, which is used for cooking purposes. In the absence of any legislative control, adulteration is widely practised. For this purpose vegetable oils and animal fats are frequently used. It is usually the middlemen or retailers who are responsible for the adulteration. Here, again, the result is the same as in the case of milk. The producer does not obtain a satisfactory price for his produce, and although there is a very distinct demand for pure and unadulterated *ghi*, consumers are seldom able to purchase *ghi* of this quality. There are several substitutes coming on to the market which are probably very valuable for the purposes for which they are used. To maintain and encourage pure *ghi* production, however, it is necessary that measures be enforced to prevent adulteration and to arrange for discrimination between *ghi* the pure product of milk, and *ghi* which is artificially prepared from animal fat and vegetable oil. In the absence of such arrangements, there is no means of bringing the producer of pure *ghi* and the consumer who demands pure *ghi* in touch with each other.

(iii) A formidable obstacle which lies in the way of cattle improvement in villages to which good bulls have been supplied is in the form of the scrub bull. Cattle breeders of the western dry tract and usually in the central humid tract castrate, for working animals, the best of their male progeny at an early age, and in the main castration is the general practice. It is difficult, therefore, to understand the origin of these inferior scrub bulls, which, though few in number, are responsible for considerable damage to the breeds. Some of them doubtless have been dedicated, but often their existence when other stud bulls are available is simply due to carelessness. In the controlled breeding areas efforts are being made to remove them, and applications are constantly being received from villagers for assistance in this work. Castration campaigns, which show a large number of castrations, are somewhat misleading. They generally mean that male animals have been castrated by official agency, which would otherwise have been castrated by the owners themselves had the campaign not been instituted. What is required is some means of removing the small scrub bull which is often left even after a castration campaign. If the staff of this section included a number of men qualified in this operation, considerable progress in this matter could be effected. In the eastern districts and in the submontane tract, draft animals are often left entire, and in these districts a cow herd containing a large number of bulls of varying sizes and ages is a common sight. These districts offer a fair field for castration campaigns, but since it is a fairly general custom to use draft cattle uncastrated, it is very difficult to suggest any method which may induce breeders to take the trouble of castrating their male stock when they can dispose of them with equal ease uncastrated. Instruction and education of the breeders combined with castration campaigns will effect much, but the progress must, of necessity, be slow.

Mr. C. H. Parr.

(*b*) (i) With regard to grazing areas, the common practice is for zamindars owning the land to lease their grazing rights yearly to a second person who charges a fee per head from the owners of those cattle which graze on it. It is, therefore, to the interests of the lessee to induce owners to graze as large a number of cattle as possible on the particular bit of grazing, the rights of which he holds on lease. Overstocking of the pastures is, therefore, a natural outcome of this process. Indian cattle seem to possess considerable power of withstanding periods of scarcity and of recuperating quickly when fodder becomes more plentiful. There is no doubt that cattle owners make great use of this quality, and in most parts of the Province make no arrangements for reducing their stock in accordance with the availability of fodder. At present, owing to religious susceptibilities, many cattle owners find difficulty in disposing of their aged stock, which are maintained long after they have passed the age of usefulness. Means that will facilitate the disposal of uneconomic stock, and which will relieve the pasture land of the burden of their maintenance, will enable the more economic stock to obtain a larger share of the available grazing, and by so doing will have very beneficial results. The number of skeletons and bones that are found lying on grazing areas indicate the number of animals that die from various causes. Many of these must have died from old age. If inducement could be given to butchers to pay a little better price for the uneconomic stock to enable them to purchase such stock before they become parasitic on the grazing areas, the expenses at present involved in collecting and transporting bones for the manufacture of phosphatic manures would be largely saved, since the animals would be driven to the slaughter-houses where the bones would be collected. This tendency of keeping alive old animals results in the depreciation of the hides, which spread over the whole Province, amounts to a considerable loss. The value of fresh bonemeal as a feeding stuff for young stock is only just being realised. The introduction of crushing machines and other necessary appliances into slaughter-houses for the rapid conversion of fresh bones would add another source of profit to those engaged in the meat trade, and another valuable source of concentrated food for cattle owners.

(ii) The borders of tilled cultivated fields are so narrow that the grass produced on them is practically negligible. What is produced is often *cheeled* by grasscutters during the cold weather, and is used for stall feeding, and what is left is grazed when the crop has been harvested. An increase or decrease in this form of pastures will have very little appreciable effect on the cattle.

(iii) In the United Provinces, where heavy yielding fodders as millets and pulse can be grown during the hot weather, it is rather surprising that cattle owners do not make greater efforts to supplement the fodder produced during the monsoon by the cultivation of fodder crops and irrigation during the hot weather. It is true that, in a few districts, there is a practice amongst a small number of cultivators to grow a small area of *juar* mixed with one of the pulses to be fed chiefly to the working bullocks just before the commencement of the rains. There is, however, no general practice of growing these heavy yielding fodder crops for other cattle, but the general tendency is to trust to a satisfactory monsoon to produce the bulk of the fodder required during the year. The low value of breeding cattle and the small profits which the cultivator derives from his cattle breeding may have something to do with this. He probably prefers to take the risk, and over a number of years the loss through making no provision is probably no greater than the expenses which would have been incurred in the cultivation of fodder crops. The provision of good bulls to increase the value of his male stock, and the proper development of the dairy industry to increase the return from milking cattle, will eventually induce cultivators to make more serious provision for their cattle during the period of scarcity.

(iv) With regard to breeding and working stock the absence of green fodders in the dry season is probably not the cause of much serious injury. It is possible that with milking cattle the yield of milk may suffer at certain periods from this cause. The cattle of this country, however, seem to have a digestive capacity particularly suited to dealing with dry fodders, and the problem as it appears to me is one of supplying fodder in quantity regardless as to whether it is green or in a dry state provided normal precautions have been taken in regard to harvesting it. In any case, fodder crops can be very easily and cheaply stored in a succulent state in the form of silage made in *katcha* pits dug in the ground, a method which is at the disposal of any cattle owner who grows sufficient green fodder and who cares to use it.

(v) As far as I am aware, no scientific inquiry has hitherto been made into the possible deficiencies of mineral constituents in fodder and feeding stuffs in these provinces. The reason for the deterioration noticeable in the cattle of the Province as one travels from west to east of the Province may lie in a deficiency of mineral constituents in the fodder which they consume. The reasons why, for instance, the cattle of the Ganges *Khadar* are very much inferior to those of the Jumna *Khadar*, why the cattle of the eastern districts and of the Tarai tract are so much smaller than those of the western districts, and why many imported breeds fail to thrive and breed well in the eastern districts are matters requiring investigation. Deficiency of mineral constituents may be one of the factors affecting them.

(*c*) With regard to the Province as a whole, there are two periods in the year when fodder shortage is most marked—

(1) in the month of March, i.e., just preceding the harvest of *rabi* crop, when the stock of fodder from the preceding *kharif* crop has been consumed.

(2) In the month of June, when the stock of fodder of the *rabi* harvest is becoming depleted, and the monsoon grass has not yet begun to grow.

The length of these periods is dependent on the weather conditions of the preceding *kharif* season. Since practically no fodder is stored, conditions which adversely affect the growth of grass and fodder crops in this season will prolong the period of scarcity. The period of scarcity in June depends on the time of arrival of the coming monsoon and also the extent to which previous monsoon has been favourable. The change from dry fodder to succulent monsoon grasses has a somewhat disturbing effect on the digestive system of cattle, and some time elapses before they can accommodate themselves to this succulent fodder. It is often noticeable that cattle in good condition at the beginning of the rains will at first lose condition, which, however, they regain a month later, attaining their best condition at the end of the rains and maintaining it for a month or so after the rains are over, during which period they seem to derive considerable benefit from dry grass and seeds.

With regard to the March period, after the harvest of the *rabi* crops the fields under *rabi* crop are opened for the grazing for village cattle, and these provide rough grazing for a week or so. If cattle owners do not supplement this sparse grazing by *bhusa* from their *rabi* crop, the breeding cattle are likely to suffer from scarcity till the break of the monsoon.

(*d*) There is no doubt that the grasses of the dry western tract, though low in point of yield, are very nutritious in quality. It is possible that all fodders of the western tract have superior feeding value to the same fodders produced in the submontane tract. The conditions of the cattle after a season of plentiful grazing is ample proof of the feeding value of the grasses of this tract. Methods of improving the common grazing areas require

investigation. There is no doubt that much improvement can be effected by (*a*) *bundhing* to prevent erosion, and (*b*) by controlled grazing to enable re-seeding to take place.

The whole question, however, requires thorough examination, and for this purpose grazing areas in several districts should be taken over and put under the management of a special investigating officer.

The large tracts of ravine country in the dry western tract following the courses of the Jumna and other rivers at present produce very little fodder. The work so far carried out by the Forest Department in the afforestation of these areas has shown that it is possible not only to afforest them, but also that such afforestation converts them into grass producing areas of no mean value. The tract in which the ravine country is situated is highly suitable for the breeding of the best types of cattle of the Province. At present this tract suffers from occasional fodder famines. When afforested a portion of the areas under forest could be held in reserve for a year in each locality against the possibility of the failure of the rains in the succeeding year. Such afforestation schemes should be started in every district where ravine country exists, and every means should be used to encourage non-official bodies to co-operate with Government in the provision of funds for this purpose.

The districts in which fodder famines are prevalent lie in the western dry tract, and in so far as the more valuable breeds are concerned, they are important breeding districts. When fodder famines occur, much injury is done to the cattle from which it takes some time for them to recover. The methods of relief hitherto adopted by Government consist of the supply of forest grass, chiefly from the eastern districts. This method is expensive and the quality of the grass supplied is very low, and it is questionable whether the amount of relief afforded is worth the expense incurred. The bulky nature of fodder makes it extremely expensive to transport, and it is therefore essential, if the cost of production is to remain low, that fodder should be produced in sufficient quantities as near as possible to the places where it is required for consumption. If the cost of production is high, cattle owners cannot afford to use it to keep alive breeding cattle, which in themselves are not of very great value. In order to encourage the production of fodder a proposal is under the consideration of Government to grant a subsidy to cultivators in districts which suffer from occasional fodder famines, who will grow under irrigation heavy-yielding fodder crops as millets and pulses during the hot weather.

(*e*) As already pointed out, the profits derived from the cattle-breeding and the dairying industry have hitherto not attracted the attention of land owners in most districts of the Province. There is no doubt, however, that there is room for improvement, and that possibilities of improvement in these two industries are very great. Wherever intensive propaganda work has been carried on by the touring staff of this section, a keen practical interest has been awakened amongst landlords, who have shown much practical sympathy with the work. The knowledge of the principles of cattle-breeding and dairying possessed by the majority of landowners is very small, and at the outset it is necessary for personal contact to be established between them and the department to stimulate any practical interest. The local Cattle Inspector is the agency through which contact can be established, and it is noticeable that a Cattle Inspector, after a short residence in a district, is freely consulted by landowners on cattle-breeding questions. When personal contact with the department is established, literature and other forms of propaganda have some real meaning. The touring staff of this section should, therefore, be extended to allow of at least one Cattle Inspector in each district to keep the department in touch with landowners and cattle-breeders and to form the centre of propaganda work.

Oral Evidence.

37,691. *The Chairman*: Mr. Parr, you are a Deputy-Director of Agriculture in the United Provinces and in charge of the cattle-breeding operations?—Yes.

37,692. We have your note of the evidence which you wish to give us. Would you like to make a statement in amplification of that note at this stage or may I ask you some questions?—You may ask me questions.

37,693. The Commission has also before it Chapter VIII, page 38, of the "Report on Agriculture in the United Provinces," which was provided for our information some months ago. Probably you are familiar with that chapter?—Yes.

37,694. Would you give the Commission an account of your own professional training and past appointments?—I received my agricultural training at the Edinburgh University; I took the B.Sc. degree in 1913, and in 1913-14 I studied in Germany. At the outbreak of the War I returned to England and I was on military service up to 1919; I came out to India on the 1st January, 1920.

37,695. Did you join the Agricultural Service at once?—Yes.

37,696. How long have you been in charge of the cattle-breeding operations in this Province?—They were transferred from the Veterinary Department to the Agricultural Department in 1921 and I have been in charge ever since.

37,697. Would you give the Commission an account of the organisation of your branch in the Province? Is it divided into circles?—No. Our staff is yet very small and it has not been possible to divide the Province into circles. Really it is divided on paper, but I have found that the district staff can be better employed in concentrated work in controlled breeding areas, namely, in two districts. The present staff of five Inspectors and one officer of the Provincial Service are concentrated in two districts. Outside those two districts we have a senior Inspector carrying on the work. I decided on this concentration because it made for economy in work. We get in closer touch with the breeder, and it gives us an opportunity of studying cattle-breeding problems and dealing with them one by one as they arise. If widely distributed, the staff are inclined to spend most of their time in travelling and they tend to give their attention to bigger zamindars, with the result that we do not get into touch with the actual breeders of the villages. So I came to the conclusion that concentration was necessary, and the result of that concentration in the two districts has justified my conclusion. That is about the district staff. The main breeding operations are carried out on two farms and they have a separate staff.

37,698. What is the total extent of the staff outside the breeding centres?—Six Cattle Inspectors and one Provincial Service officer.

37,699. You give us some interesting notes on the several recognised breeds or types of cattle found in this Province and you say on page 441 of your note: "To enable improvement to be effected in the various types and breeds it is necessary at the outset to establish pedigree herds of each type." I understand that for the present you are confining the efforts of your staff to the four breeds, viz., the Hariana (Hissar), Kherigarh, Murrah buffaloes and Sahiwal?—Yes.

37,700. Did you make that choice, or did your predecessors make that choice, as a result of experiments with all the breeds?—My predecessors had already started the work. The land was acquired in 1912-13 for the two farms, and when I took them over herds of these breeds were already established on the farms. This was as a result of a survey that had been

carried out by Mr. Moreland. He made recommendations on the basis of that survey and the work started was based on those recommendations.

37,701. Do you yourself subscribe to the view that these breeds you are dealing with at present provide all the material which you require, or would you like to make experiments with other breeds in the Province?—I think the work now in hand is sound, but I think it should be extended to three other breeds.

37,702. Do you regard the production of a dual purpose animal as your ultimate goal?—That is possible in two of these breeds, the Hariana and the Mehwati; but I do not think it is possible with the Kherigarh breed.

37,703. Meanwhile, you are not dealing with the Ponwar breed, are you?—No.

37,704. Are you making any experiments in the direction of crossing indigenous cattle with European stock?—Work of that nature had been started and I am carrying it on. I think when I took over charge there were something like 30 head of cross-bred animals of one type, Ayrshire-Sahiwal.

37,705. Have you yourself seen the Military Dairy farm at Lucknow?—Yes.

37,706. What view have you formed of the value of the Holstein cross-breds there?—I have not examined the results of that cross.

37,707. How about your experience with the Ayrshire cross? What do you say about that?—From the general results which we have obtained, the first cross is very satisfactory and very promising. I have never gone beyond the first cross because by the time I arrived at the first cross the Military Dairy farm authorities began to report that the second and third crosses were not satisfactory.

37,708. You have not yourself gone past the first cross?—No; my experience is limited to the 30 head of cattle of that cross.

37,709. On page 443 of your note you are talking about the possibility of extending cattle breeding on a commercial scale, and you say: "Since crop production brings in a better return than cattle breeding, the attention of enlightened zamindars and others, who have, in recent years, begun to take a practical interest in agriculture, is attracted more to crop production than to cattle breeding." Do you know whether, in fact, the zamindar can make cattle breeding paying at all?—I think he can, under certain conditions; but the conditions do not exist, for instance, extensive grazing. Grazing is limited by cultivation.

37,710. *Mr. Calvert*: Free grazing?—Yes, practically; the grazing fee charged is nominal in comparison with the cost of fodder crop-production.

37,711. *The Chairman*: Then you go on to give us an account of the system of using the bulls that you are producing on your breeding stations. What is the extent of these controlled breeding areas which you are talking of?—The Muttra area which was only started two years ago contained 50 bulls last year and these were located in 50 practically adjacent villages; now it has been extended to 80, so that the work now comes practically half one tahsil.

37,712. Do you regard the gradual expansion of the controlled area as the normal method of development?—The object is the supply of bulls. At the commencement of my work I bought Hissar bulls from the Hissar farm. During the last two years the Hissar bull in the Punjab has increased in popularity and I have started to provide means of producing a supply in response to the demand which is likely to spring up in the United Provinces.

37,713. Are you attempting to protect this improved blood against rinderpest?—No.

37,714. You do not consider that a practical policy?—I do not think it is practical.

37,715. The Muttra area itself has only been in existence since 1923. Do you think you notice any improvement in the cattle during these three years?—When the bulls are sent out they are quite young. We are just beginning to get stock produced by them.

37,716. The whole system is in the experimental stage?—Yes. As far as the system of concentrating bulls is concerned, I think it has proved very satisfactory. We find that the actual village proprietor wants the bull. At first he was asked to pay two-thirds of the price, which worked out at Rs.60, and he contributed freely. Now I have changed the plan and we are issuing bulls on a *taccavi* scheme whereby he pays Rs.120 in two instalments.

37,717. You say that " contrary to general opinion village cattle owners are not apathetic to cattle improvement "?—That is a statement based on the result of the work in the particular breeding areas.

37,718. You find a growing interest in cattle improvement in those districts?—Yes.

37,719. Are you carrying out any propaganda as to the provision of fodder in the areas where those selected bulls are used?—Yes; we are now issuing big posters giving the breeders indications as to how to get the bulls and what to do when they get them, and giving general instructions as to how to proceed to get the best possible results. We propose to stick up posters in every village.

37,720. Are they out yet?—They are in preparation.

37,721. What are you recommending in the way of forage?—We can make no particular recommendations beyond what they have already got. We can recommend them to grow more and encourage them to preserve it. I do not think that we have any recommendations which would be of any benefit to them, or which are likely to be accepted or adopted by them. In the matter of particular fodder crops, lucerne, for instance; the area under lucerne, in the Meerut District, has increased for some reason or other, perhaps because of better irrigational facilities or a local demand for it from cantonments; that is exceptional. The general tendency is to stick to the main cereal crops.

37,722. How about fodder preservation? Are you advocating the use of the silo?—Yes; in Muttra we carried out demonstrations last year and two silo pits were made by zamindars which were found to be quite satisfactory.

37,723. At the zamindars' expense?—We dug the pits; the crops were theirs and they made and utilised the silage.

37,724. Are they likely to continue the practice from year to year?—I think it is a practice which can be adopted. The trouble with it is that it requires very careful practical demonstration. Leaflets and ordinary verbal propaganda is of no use. Mistakes have often been made on my farms, and I think that it is a process which should be demonstrated very carefully in order that no mistakes may occur which would tend to prejudice the process in the eyes of the people.

37,725. On page 444 you tell us that the Cawnpore District Board recently subscribed Rs.10,000 from its own funds to supply, on easy terms, 100 cows of the Hariana breed to the zamindars of the district. What is the value of the average cow of the Hariana breed?—They were bought at prices ranging from Rs.100 to Rs.120. The District Board did not make any

money out of this transaction; on the other hand, it did not incur much loss.

37,726. What do you think persuaded the District Board to take this step?—I think this District Board is one of the richest Boards and they seem to have a fair representation of members having agricultural interest on the Board itself. They took about 20 Government bulls last year which were distributed in the district. When inspected they were reported to be always in good condition. It seems to me that this is a direction in which much improvement can be made. Members of my staff have frequently discussed the possibilties of cattle breeding with the District Board and this is the outcome of these discussions.

37,727. And these cows become the absolute property of the zamindar who takes them from the Board?—Yes; the Board has tried to locate them somewhere in the neighbourhood of the Government bulls, and they have all been earmarked and their particulars recorded in registers.

37,728. Do the District Board allow you to have any alien stock?—We shall have to make terms with the owners of the cows.

37,729. Have you any co-operative dairy industry in this Province?—One was tried at Allahabad and it proved a failure. It is not a line that I have taken up myself. I think that it is rather difficult to get people in this country who deal in a commodity like milk to co-operate. I think they can get better profits by trading alone.

37,730. On page 445 you say: "The organisation of collecting, transporting and distributing agencies by men of position and standing, which will arrange for the collection of milk from village producers," and so on, is desirable? I do not quite see there what you mean by the expression "men of position and standing"?—The dairy trade at present is in the hands of *gowalas*; they are men who own a few cows and they buy their fodder chiefly; they are not cultivators and do not own land; they simply own a few cows and from these they supply milk. They are elusive in a way, and it will be very difficult to bring them under legislation. I think myself that if we could get, say, the better type of cultivator, the small zamindar or people of education to take up the business, the possibilities are very great.

37,731. Do you not consider that any organisation of that sort, involving, as it must involve, competition on a commercial scale with the existing *gowalas* is liable to meet with very considerable opposition and open hostility?—Yes, that is so; it has therefore been necessary to give at the start some sort of a subsidy.

37,732. Do you get cases of poisoning here?—No. I know of no cases.

37,733. Have you any municipal rules or acts protecting the public in the matter of the standard and purity of milk in your towns?—I heard the other day that there was a clause in the Municipal Act of the Muttra Municipal Board, but I think that it has been very ineffective.

37,734. At Cawnpore?—I do not know.

37,735. And at Lucknow?—I do not know of any such provisions being contained in the Acts of other Boards.

37,736. Do you not think that until the public is so protected there is very little chance of a man who wishes to sell pure milk of good quality being able to do so at a profit?—Yes, I do. I think that such protection is absolutely necessary.

37,737. I shall not ask you to suggest how you propose to meet the problem presented by you at page 447, which is to limit the number of uneconomic animals consuming the grazing, because I do not believe that you have any suggestions to make, nor have I heard any since I came out to this

country?—I have a suggestion to make which, I think, however, is rather a broad one, with regard to economic stock. What has always struck me as being remarkable is the great number of bullocks used purely for road transport. Considering the country is one in which there is a great shortage of fodder, I have always thought that if motor transport were given greater facilities for development a greater consumption of petrol would cause a decreased consumption of fodder, since the number of animals which are consuming valuable fodder would be reduced.

37,738. Do you not think that the more you leave the limited fodder available to be eaten by uneconomic stock, the larger the number of uneconomic stock will be?—That is so.

37,739. Is castration the only possible solution to the problem in India?—I think that the number of uneconomic stock will be reduced when the breeder finds that his economic stock are productive of better results. For instance, if the village breeder could get a better return for his milk, the tendency would be for him to keep better milk animals, but if there is no return he will keep as large a number of cows as possible, because any outbreak of disease might reduce his number.

37,740. Do you think that it would be a great advantage if the money value of Indian cattle were to be raised?—Yes, I do, if that would bring about a diminution in numbers.

37,741. And it would also have the effect of making it worth a man's while to look after his cattle and to take more pains in choosing stock for breeding?—Yes.

37,742. On page 448 you talk about the relative nutritive value of various fodders. Have you studied at all the work being carried out on animal nutrition at Bangalore by Mr. Warth?—I have seen the leaflets that have been published.

37,743. Would you regard that as a very important line of research?—Yes.

37,744. Have you experimented at all in the direction of trying to find leaves of trees upon which cattle can feed in times of shortage and which are normally out of their reach?—We have done no experiments in that direction.

37,745. Do you think that anything can be done in that direction?—Certain satisfactory results have been obtained in the Punjab in the Hissar farm.

37,746. Have you much prickly pear in this Province?—Very little.

37,747. Do you regard your present efforts as adequate in face of the cattle population in the Province and the obvious need for improving the breed?—No; I think they are totally inadequate. We could do a lot if the staff were increased. The staff at present is lacking in under-structure. We want staff in every district. If we had the staff to carry out sufficient propaganda work, I think the breeders themselves would come forward and finance a considerable part of the operation themselves.

37,748. You have already had practical indications of that?—Yes; I think that the staff would be paid for many times over.

37,749. Have you ever attemped to formulate a scheme which in your view would be sufficient and adequate?—No, I have never formulated a complete scheme. I think that there should be at least one touring officer in each tahsil. Such a provincial staff would be in a position to cope with the whole problem. The moment work in a certain area commences, the officer cannot leave the area. The work develops rapidly and soon requires undivided and continuous attention.

37,750. Have you ever calculated as to how long it would take, with your present staff and expenditure, to effect a substantial improvement in the average animal in the Province?—I think that we shall see an improvement, say, in ten to fifteen years if the work is continued on the lines already begun; it might possibly be less; perhaps in 10 years we shall see considerable improvement in the controlled breeding areas. It is all a question of the supply of good bulls, and it is really very striking to see, in a short space of time, the amount of improvement which the use of a good bull can effect.

37,751. And do you find that as a rule the cultivators are prepared to make use of the good bull provided?—Yes.

37,752. *Sir James MacKenna*: What particular problems were you studying at Leipzig?—I was working in the Bacteriological Department.

37,753. I understand that in this Province you have a Cattle Committee to assist you?—Yes.

37,754. How is that composed?—The Director is the Chairman, the Legislative Council nominate two representatives, there is a representative of the Agra Zamindars' Association, and there are two representatives nominated by Government. The Veterinary Adviser is also a member. I think it is all given in Mr. Clarke's note.

37,755. Does that body function well? Does it take a lively interest in the subject?—Yes.

37,756. They are of real assistance to you?—Yes. They attend the meetings, discuss the proposals put up and have made some useful suggestions.

37,757. They have been of real assistance?—Yes. In time I think the Committee will become a very useful body, and will represent agricultural and breeding interests.

37,758. Did you attend the last meeting of the Board of Agriculture, when cattle was the principal subject discussed?—Yes.

37,759. Was that meeting of advantage to you in your work?—Yes. I think such meetings are useful. They give one a chance of hearing the points of view of other Provinces, and of meeting other officers engaged in the same work.

37,760. You would be in favour of regular sectional meetings of officers working on cattle improvement?—Yes.

37,761. Have you derived any help in your work here from the Imperial Dairy Expert, Mr. Smith?—I occasionally refer questions to him for advice, and he gives me the information and advice I require.

37,762. Has he visited you here?—No.

37,763. I understand that at the meeting of the Board of Agriculture to which I have referred the idea of a Central Cattle Bureau was discussed. What are your views as to the possible value of such a central organisation?—I think some organisation of that kind should be started. We must not expect immediate results from it, but eventually it will be very useful.

37,764. What staff will be required for such a body?—I think the office and staff of the Imperial Dairy Expert will be able to cope with the work.

37,765. What about technical staff? At present the technical staff may be said to consist of himself and Mr. Warth's section at Bangalore; do you think there is any need for a big central technical staff?—They would want something more to do if there were such a staff. They might with advantage be utilised for instructional purposes at some centre for training in animal husbandry and dairying.

37,766. You think that is the direction in which they would prove most useful?—Yes.

37,767. The actual work in the Provinces could continue to be organised as at present?—Yes.

37,768. Subject to advice from the central authority?—Yes.

37,769. To what extent do you think cattle breeding and dairy work can be co-ordinated throughout India?—To the extent to which this Cattle Bureau will be able to co-ordinate it.

37,770. It would act as a co-ordinating body?—Yes. At present things may happen in other Provinces which we do not hear of; a co-ordinating body would be useful.

37,771. Do you think any stimulus would be given to cattle-breeding by the organisation of All-India shows, on the lines of those which have been so effective at Home?—The trouble is that the cattle owners are mostly poor men who cannot afford to take their cattle to big shows.

37,772. There is no cattle-breeding class here such as we have at Home?—No.

37,773. Do you think that prizes and so on would not bring such a class into existence? Are they all small men?—I think at present the man who takes a real interest in cattle and who will go to a show and watch the judging with interest is the small man.

37,774. Have you had any men from this Province trained at the Imperial Institute in dairying?—Yes, we have two men who have been through a six months' course, and one is now undergoing training in the same course.

37,775. A proposal has been made to publish a journal devoted almost entirely to cattle-breeding and dairy problems. Do you think that will be a good thing?—Yes.

37,776. The Agricultural Journal does not give you sufficient information on those questions. You think you should have a separate journal?—I think a special journal will encourage contributions and stimulate people to write on problems which are of interest to those engaged in cattle-breeding but are not of special interest to other members of the Agricultural Department.

37,777. *Professor Gangulee*: Will that journal be published by the Central Cattle Bureau?—It could be.

37,778. Would you recommend that?—Yes.

37,779. How often does your Provincial Cattle Committee meet?—Usually twice a year. It met in February last year, but has not met since.

37,780. Are the proceedings published?—A communiqué is sent to the press.

37,781. We understand that your work is now chiefly confined to the control of breeding areas?—Yes, the staff is chiefly concentrated in those areas.

37,782. The idea is to facilitate supervision and get results more easily?—Yes.

37,783. Can you give us further details of your organisation for the distribution of bulls? What are the channels through which you distribute these bulls?—In the controlled breeding areas the Cattle Inspectors get in touch with the breeders.

37,784. The Cattle Inspectors are under you?—Yes, they are part of my subordinate staff.

37,785. *Mr. Calvert*: Are they veterinary men?—One is; the others are members of the Subordinate Agricultural Service.

37,786. *Professor Gangulee*: These Cattle Inspectors go from village to village?—Yes, and get indents from breeders or villages. Now that the villages have to pay, they are submitting indents under a *taccavi* loan scheme.

37,787. These bulls are not given on loan from the Government?—They have been, but now these people are paying for them and they will become their own property.

37,788. Do they get them now individually or collectively?—We get a zamindar who will give security for the *taccavi* loan. He may recoup himself from the village or not; that is his affair.

37,789. Do District Boards ask for bulls from your Department?—Yes.

37,790. In large lots?—We try to send them a lot at a time.

37,791. Is more than one District Board interested in it?—Yes. This week I have sent 15 bulls to the District Board at Cawnpore; Farukhabad, which has eight already, is taking 15 more, and I am sending a dozen to Shahjahanpur. Altogether I am sending out 42 this week.

37,792. So you are able to supply bulls to District Boards outside the controlled areas?—Yes.

37,793. Do they pay for them?—They only pay way expenses. The idea is that before we ask people to pay we must demonstrate the value of the bulls, so we send them out through the District Board or through our staff on loan.

37,794. How do you supervise this work? These bulls are now being distributed all over the Province, and it is necessary to have proper supervision?—If we had more staff we could undertake the supervision, but, as it is, a lot of the work is unsupervised. We attend to complaints, but when there are none we take it that all is well.

37,795. Do the villagers co-operate in the work of eradicating scrub bulls?—Yes.

37,796. Have you employed co-operative agencies for the introduction of better bulls or better kinds of fodder?—I have addressed the Registrar of Co-operative Societies regarding a bull purchase scheme. The Co-operative Department is very sympathetic, but I think it has already as much work as it can manage.

37,797. I understand you are not conducting any experiments to determine the food value of various grasses and fodder crops?—No, we have no facilities.

37,798. But you carry out silage experiments?—Actual feeding experiments? No.

37,799. You try to preserve fodder by silage?—Yes. Silage is our chief feed.

37,800. Do you use tower or pit silos?—Both.

37,801. Which is the most convenient?—I think pits.

37,802. Pits in this part of the country will have to be shallow, because the water-level is high?—Yes; about 4 feet.

37,803. Who teaches animal husbandry at Cawnpore College?—The Professor of Agriculture and his staff.

37,804. You do not take part in teaching?—No.

37,805. Are you in touch with the Allahabad Agricultural Institute?—Yes.

37,806. To what extent is the silage method known to the cultivators? Do they know anything about the preservation of fodder?—Very little I

think. We carried out a small demonstration in the Muttra district last year and we carried out further demonstration this year; I have a proposal with regard to that in this year's schedules. I think it is a process which requires very careful demonstration.

37,807. Is the practice of castrating bulls popular among the cultivators? I think you adopt the Italian method?—Yes, it is being adopted, I think, but still the country method is the method generally adopted.

37,808. You discontinued the crossing of Ayrshire and Montgomery?—Yes.

37,809. Why?—The Ayrshire bull died and a lot of his progeny died of rinderpest.

37,810. Of the various breeds of cattle in this Province, do you find the Hissar breed more promising from the point of view of milk yield than any other breed?—From the point of view of milk capacity the Sahiwal is the real milking cow, but the Sahiwal is not indigenous in this Province; it is a Punjab breed. Of the indigenous breeds the Mehwati is the most promising, but that is only indigenous to a few districts. We are taking up the Hariana or Hissar because they are such excellent draught cattle. The cultivator's first requirement is a draught animal, and if we can add a little milk capacity to that draught capacity, we shall have a good animal.

37,811. Have you a system of milk recording on your farms?—Yes, on the farms the milk is recorded.

37,812. Do you grade your animals?—Yes, we grade them and feed them in accordance with the amount of milk they produce.

37,813. With a view to balancing the ratio of food and milk?—Yes.

37,814. Do you consider that the standardised method of keeping records of breeds and their performance would be useful throughout the country?—I think there are very many more pressing problems.

37,815. But you are going to establish a herd register some day, I hope?—But the money that would be spent in establishing records and employing staff to carry out the work necessary to establish records of that type, could be very much better employed in dealing with some of the more immediate problems.

37,816. But if you are going to build up a herd, you must have a herd register to begin with?—Yes.

37,817. For that you require a certain standardised system of registration?—Yes.

37,818. Do you think uniform methods of grading and recording would be useful?—Very useful if the staff were available. It would take some checking and the staff would have to be of a fair standard of honesty and trustworthiness.

37,819. Do you find any indication of co-operative production of dairy produce being undertaken in the villages?—I do not think so.

37,820. Of course, success in cattle breeding depends largely on the improvement of the village dairy industry?—Yes.

37,821. If you do not make your village dairy industry pay, you cannot make the cultivator interested in breeding work?—No.

37,822. So, you do not think there is, as yet, any indication in the direction of co-operative production being taken up by the villagers themselves?—No, I do not think so; I think along those same lines there is an opportunity for development, but operations must be organised by one individual.

37,823. We are informed by a writer from this Province that milk is four seers per rupee in Allahabad while it is 12 seers per rupee only 15 miles away from Allahabad?—Possibly.

37,824. Do you think anything could be done to develop village dairy industry through co-operative organisation?—Yes, that is one of my strongest recommendations.

37,825. *Mr. Calvert*: On page 443 of your note, in connection with your controlled areas you have mentioned that the male progeny are being reserved for purchase by the department for re-issue. Is that not rather mixing up your pedigree?—Yes, but it is not indiscriminate; we are selecting particular cows.

37,826. That is a temporary measure?—The progeny will not be re-issued to the districts where the controlled breeding is in operation; they will be sent to other districts. The average bull so bred will be very much better than the bull that is now being used in most villages. A selected bull from one of our Hissar stud bulls out of a good average cow is a very much better stud bull than at present exists in many districts; these bulls will not be put back into the controlled breeding areas.

37,827. How do you get over the difficulty of feeding these bulls in your controlled areas?—There is no difficulty at all; the villagers themselves, the breeders, are very willing to let them graze their own crops.

37,828. They do not get too wild?—No; I insist on the bulls being brought into the village every night, and they are fed a little grain or something.

37,829. In discussing milk problems, you have made a series of statements; have you carried out any investigation into the economics of rural milk production?—We have a scheme working at Agra and I believe the proprietor of the scheme is going to give evidence before the Royal Commission.

37,830. But has a real investigation been made of the economic side?—Beyond what has been forthcoming from this scheme nothing has been done.

37,831. When you say that the cost of the production of milk puts it beyond the purchasing capacity of the average cultivator, is that a guess or is that the result of a careful investigation?—There is no desire on the part of the cultivator to produce it. If he can sell it, he will produce it, but if he cannot sell it he does not produce it.

37,832. But he produces more?—He will produce more if he can sell it.

37,833. Is that opinion you have expressed this moment based on a careful investigation, or is it a mere guess?—I think it is an opinion that has grown on me. I would not like to say it is a guess. I still hold to that opinion. I cannot quite account for it.

37,834. It is not based on a special investigation?—No.

37,835. Similarly, on page 446, you give another opinion; you say there is no doubt that if it were possible for an average cattle owner to obtain somewhere near the price for milk that a milk consumer is willing to pay, he would make it his business to increase his stock. Is that a guess or is it the result of a careful investigation?—It is very noticeable that, where we have had these milk schemes started, the first thing the milk producers have asked for is an advance for the purchase of good cows. They ask the organiser of the scheme to give them such advances, and in fact if he gives them advances it ensures the success of the scheme; I argue from that that if by such means they get good cows and then take one of our bulls, improvement will follow.

37,836. That is not based on observation of an actual case?—Yes, that is what happened in this very village; advances were made to them to buy she-buffaloes and they have taken a buffalo bull from a Government farm.

37,837. You say he would make it his business to improve his stock by careful breeding; that is a very different thing?—They have taken so much care that they started off with good females and they have taken care to obtain a good male.

37,838. To the agnostic mind you are not prepared to produce your evidence; you have not any evidence to produce in support of that?—No, not beyond that.

37,839. Do you think your town consumer is willing to pay for pure milk?—I think he is. I am not speaking generally of all town consumers, but I think there are town consumers who would be very willing to pay for pure milk.

37,840. Do you know a case in which an effort to supply pure milk has been organised and the town consumer has been willing to pay the price for that milk?—We are just organising a scheme at Muttra; farm milk is being supplied to Muttra and the price, of course, is cheap.

37,841. Do you think the town people are buying Keventer's milk?—I do not think they will pay the price that he charges for it.

37,842. Practically nobody will buy Keventer's milk?—No, but I think milk from the village can be supplied very much cheaper than Keventer can supply it.

37,843. Milk can be supplied but people will not buy it?—They will buy it provided the price is not too high; pure milk can be supplied at six seers a rupee.

37,844. You say there is a very distinct demand for pure and unadulterated *ghi;* is that based on any successful attempt to sell pure *ghi*?—No.

37,845. Do you know of anyone in any town in the United Provinces who is prepared to sell pure *ghi* as such?—No, he cannot compete.

37,846. They will not sell pure *ghi*?—No, but my point is that if the public were sure that they were buying a pure article, which they are not, they would be willing to pay the price.

37,847. You have actually found people, even among the educated class, willing to pay for pure *ghi*?—I have never dealt in *ghi* myself, but that is my opinion.

37,848. I ask because we did put pure *ghi* on the market and no one would buy it. Have you ever worked out how many days a year a pair of bullocks is employed on your average holding of about 7·7 acres?—No, I have never worked it out.

37,849. Would you be surprised if it came to less than 70 days a year?—No, I would not.

37,850. Using bullocks for road transport is a method of employing them during the 290 empty days?—Yes.

37,851. Your department was formerly under the Veterinary Department and was placed under the Director of Agriculture in 1921?—Yes.

37,852. Do you consider that to be an advantage?—I think it is.

37,853. You think cattle breeding should be under a chemist rather than under a veterinary officer?—I think an agricultural chemist with experience in all agricultural problems is better able to deal with cattle breeding problems from an agricultural point of view than is a veterinary officer.

37,854. On this question of supplying milk to towns by better breeds of cattle, do you think liability to disease is an important factor?—It is, when the cattle are valuable; but if the cattle are not valuable, and many of the United Provinces are not, the importance of it can be over-estimated.

37,855. You are taking up the improved breed with a view to get a better milk supply?—Yes.

37,856. Do you not think the control of disease will be a very important factor in that?—Undoubtedly, it will be.

37,857. So that really you are not going to make much progress with superior breeds of cattle until you get greater immunity from disease?—Loss from disease on the Government farms is very small; it does not amount to more than 6 per cent. per annum.

37,858. *Mr. Kamat*: In this Province are there any instances where dairies were started by private agencies which failed?—I believe there are.

37,859. Did you investigate the causes of the failure in such cases?—No.

37,860. Can you guess what those causes might be?—I think unfair competition is the chief cause.

37,861. Competition with the *gowalas*?—Yes.

37,862. You suggest legislation as a remedy to prevent adulteration. We were told in another place that in towns or cities like Bombay legislation was attempted to prevent adulteration, but still prosecutions were not successful because the milkman or the middleman somehow or other managed to evade the law by changing the names or by other devices. Do you think that would be likely to occur here also?—I think it is quite possible; yes.

37,863. Then again if you legislate and have only pure milk on the market, as my colleague has suggested, what would be the result so far as the prices are concerned for the poorer classes of people?—The price might go up to start with, but legislation would so encourage production that the price would go down again; I think production would overtake it.

37,864. Supposing my *chaprassi* were a married man and he required half a pound of milk every day for his infant; would he be prepared to pay at the rate of six or eight annas a seer?—I see no reason why the price should go up to that extent. The price might go up a little to start with, but it would go down the moment people began to realise that here was an opportunity of carrying on the trade with honest competitors. I am sure the encouragement would be so great that in fact the price of milk a few years afterwards would be lower than it is to-day and it would be a pure supply too.

37,865. *Professor Gangulee*: You mean there would be more milk in the market?—Yes; there would be plenty of milk; the actual supply brought into the city would be greater.

37,866. *Mr. Kamat*: Here again we have the experience of two or three cities where milk committees were started to investigate the problem, committees of experts. They went into the details of the problem, how much the price would go up, what the supply would be and so on, and the opinion of these milk committees was, I think, that the poor man would go without milk. Would you agree with that?—I should like to see what the result would be under actual legislation and compare it with the deliberations of the committee.

37,867. As a matter of fact it is based on a close investigation of the problem rather than a mere guess?—I think the result of an actual trial of anything in this country may probably be very different from the opinion one forms as a result of long discussion and deliberation.

37,868. Taking another remedy suggested by you, namely to establish collecting agencies near big towns for collecting the milk from villages and transporting it under certain conditions, can you amplify that by taking a concrete case of a town like Cawnpore or Lucknow? What is the present rate of milk in Cawnpore?—Four seers per rupee.

37,869. What is the rate beyond ten miles of the city?—It will probably be eight seers per rupee.

37,870. And what would be the cost of transport and collection?—The case I have in mind is a case of a scheme actually in operation in Agra. I

think there the price is somewhere about four seers per rupee. The scheme is very successful there.

37,871. In that case, after getting this milk from the villages have you been able to sell it in the town at more than four seers? What was the rate in Agra before you began collecting the milk from the villages and what is the rate now? Has it become cheaper?—I do not think a sufficient amount of milk has been brought in to affect the prices. The difficulty is we have not been able to find other men to start this business.

37,872. *Professor Gangulee*: The method of transportation is a factor to be taken into consideration?—Yes.

37,873. *Mr. Kamat*: From that one concrete instance of Agra you are not in a position to say that you have been able to bring down the rate?—Now they are dealing only with ten to twelve maunds; but if we had ten such organised schemes there is no doubt that the price would come down.

37,874. You mean, by tapping all the villages within a radius of ten or twenty miles?—Yes. If two villages can supply ten to twelve maunds you can imagine how much milk there is that can be tapped from all the villages, and if all is brought in it will certainly affect the price.

37,875. Why has not this sort of business been taken up by private individuals if it is a paying one? If you can get milk at the rate of eight seers per rupee by going twenty miles off and can sell it here at four seers a rupee, how is it that a large number of middlemen have not sprung up?—That question may be asked. The selling of milk has to be taken up on a large scale. The producing centre requires certain conditions, for instance, the proprietor, if possible, should be a zamindar, for then he has a certain amount of control over the producers and he can say to his tenants, "I want so much milk." Again the handling of milk requires technical skill. Competition with *gowalas* has to be faced. If possible, the proprietor should be a man of standing in the place where the milk is consumed so that he can keep in touch with the consumers. The business requires much technical knowledge and skill.

37,876. *Professor Gangulee*: Would you not sell that milk after pasteurisation?—Yes; if there are such facilities it will help the business considerably. Morning milk can be sold in the evening and the evening milk in the morning. The villager has special times for milking.

37,877. *Mr. Kamat*: These are all minor difficulties. One need not count them as serious difficulties, especially if a man can double his money; he must be prepared to undergo such difficulties if he wants to make money?—There is a profit in it, but it is not a matter of doubling the money.

37,878. With regard to your idea to legislate in the matter of *ghi*, I suppose you presume that there should be two classes of *ghi* placed on the market, one, pure *ghi* for the better class of citizens who can afford to pay for it, and the other what you call discriminating *ghi*, that is, artificial *ghi*, for the middle class or the poor class; is that the idea?—Yes.

37,879. Obviously you wish to have two kinds of *ghi*, first class and second class?—*Ghi* as the product of milk and *ghi* as the product of the vegetable oils.

37,880. So that the purchaser who wants the cheap *ghi* goes and buys it with open eyes?—Yes.

37,881. *Sir Ganga Ram*: Are the male calves produced as a result of crossing by foreign bulls good for ploughing purposes?—That depends on the female side.

37,882. Do the qualities take after the mother?—Yes, to a certain extent. They do produce very good cattle. I have cross-bred bullocks from several breeds, including the Ayrshire cross with Hissar, and they are very good.

37,883. Does the off-spring stand the climate?—Yes.

37,884. On page 448 when you speak of mineral deficiency, have you in mind salt or any other mineral?—Phosphates and lime chiefly.

37,885. Lime in what form?—Ground lime.

37,886. Put in the fodder?—Yes.

37,887. Has that been tried?—Yes; it is an adopted practice at Karnal.

37,888. Not merely salt?—No.

37,889. Do you recommend the addition of salt?—Yes.

37,890. How much?—One lb. per 100 lbs. of ration.

37,891. Would the giving of salt improve the milk supply?—I think it is essential for the well-being of the animal.

37,892. You say in one place that Government gives a subsidy for breeding cattle; how much is that?—The only subsidies given by the Government are given for the milk schemes and in the shape of assistance to District Boards.

37,893. Do you mean by subsidy that the money has got to be paid back to the Government?—It is given as a grant and has not to be paid back.

37,894. Have you ever come across cases in which sweepers have been thrusting poisoned needles in order to kill the cattle so that they may obtain the carcass of the animal? This used to be done in the Punjab?—I have not heard of any actual cases.

37,895. You know the system in the villages is for the sweeper to take away any dead animals that lie about the place, and in order to obtain more dead animals, the sweepers in the Punjab have been doing this mischief? It has been stopped now?—No, I have no experience of it.

37,896. *Sir Thomas Middleton*: In the Report on Agriculture in the United Provinces, which has been given us, particulars are given for four areas, Meerut, Jhansi, Gorakhpur and Lucknow. We have got a number of details about the size of holdings, etc., for these areas. I want you to tell me, if you can, in which of these districts you find the best cattle?—In the Meerut district.

37,897. Can you give me any indication of the cost of keeping a pair of bullocks in Meerut?—I think it is about a rupee a day.

37,898. It would not cost a cultivator Rs.365 to keep his pair of bullocks for the year?—I have not worked it out in detail and I think that to arrive at the actual figure will require a very careful investigation.

37,899. A statement is made in this Report that the allowance for grain for two bullocks and two cows is two maunds; that is the amount that is allowed in this estimate of the cost of keeping bullocks. If the cows get nothing at all it means that the two bullocks get no more than 2 lbs. of gran for 40 days. That must be incorrect, and I want you to go into this question of the cost of keeping a pair of bullocks and give us your considered view with regard to the Meerut district. I think you know the Meerut district best?—Yes, I will let you have it.

37,900. In the Meerut district one pair of bullocks cultivate about nine acres, and of that area about one acre or rather less than one acre on the average will be irrigated from wells. What area of land ought a good pair of bullocks to be able to cultivate in the district?—Probably 15 to 17 acres.

37,901. So that there must be, on the average holding in the Meerut district and in other districts where the figures are similar, a great waste of bullock power, assuming the bullocks to be good animals?—Yes.

37,902. When we have got your figures as to the cost of keeping the cattle we can estimate what that means to the cultivator?—Yes.

37,903. In connection with your breeding operations: I think you are at present breeding mainly for draught?—Yes, we look upon that as the primary consideration.

37,904. Which of these breeds that you have described in your memorandum have shown most uniformity and most signs of careful breeding in the past? Looked at from the point of view of breeding, which is the best? —I think the Mehwati is the best.

37,905. So that the Mehwati would make a good foundation stock?—Yes, it would.

37,906. What advantages do you claim for a diversity of breeds in the Province, assuming they are draft breeds?—We have rather diverse conditions. There is a tract of country with a rainfall of 22 inches, another whose average is 40 inches and yet another which is a big area, with a rainfall of 60 inches.

37,907. From your memorandum I gather that you want heavy bullocks in certain areas and light bullocks in other areas?—It is not a matter of weight; it is a matter of which class of animal will live and thrive under the prevailing conditions. Take the Mehwati, for instance, in the eastern districts he becomes sluggish and does not show the same activity he displays in his own tract, besides this he is expensive to maintain in the eastern districts.

37,908. In his own tract the Mehwati is as active as the Kherigarh?—He is a heavier animal but, comparatively speaking, just as active.

37,909. Do you think that when the Mehwati goes into the eastern districts he may not get enough food to keep up his bigger body, and that it is for this reason that he becomes sluggish?—No; my experience has been that during the first year of his use on an eastern district farm he was found to be very active and satisfactory; in the second year he showed signs of wear and tear, and afterwards became gradually less active.

37,910. So that you are satisfied that at least several breeds are wanted in the Province?—Yes.

37,911. With regard to the distribution of cows on cheap terms in the areas of District Boards, do you know if any members of the District Boards have secured cows under this scheme?—I believe they have done so.

37,912. So that this would add to the popularity of the scheme with District Boards, would it not?—Yes.

37,913. On page 445 you refer to the fact that the potential milk capacity of the Provinces is greater than the purchasing power. How much milk do the calves get in this Province? Is there any area in the Province in which a calf gets enough milk?—The male calf always gets enough milk; the female calf often goes short. That is the general rule.

37,914. I suppose the calf gets as much milk as its mother can give, but, as you point out, probably the best mothers do not give as much as 10 lbs. of milk a day?—That is enough to rear a calf.

37,915. But what does a fair average cow give per day?—It would probably not give 3 or 4 lbs. But it is a case of habit with the calf which, from its very birth having been used to a small quantity of milk, can maintain life on a small yield of milk from its mother.

37,916. On page 447 you say that Indian cattle seem to possess a considerable power of withstanding periods of scarcity. You appear to be unduly cautious about that, but is it not an undoubted fact that they do possess that power? What would happen to the stock which you have seen in Britain if they were exposed to the conditions to which Indian cattle are exposed? How long would any improved breed of animals stand the

treatment that the animals of this country get?—Yes, that is one of the most valuable points in the Indian breeds.

37,917. They are undoubtedly very hardy, are they not?—Yes.

37,918. Sir Ganga Ram referred to the deficiency of minerals? Have you noticed, in any parts of the Province, cases of depraved appetite, cattle eating earth or excrement?—Yes, I have.

37,919. In which tract?—I have noticed it particularly in the western tract. It has not absorbed my serious attention, but I have seen cases.

37,920. Wherever that is noticed, special attention should be given to the mineral supply of cattle?—Yes.

37,921. You say that fodder is never stored. By that you mean that *kadbi* is never kept over from one season to another?—Only in small quantities. The practice is not followed to the same extent it is in the Punjab. The conditions under which it is kept in this Province are not good and during the monsoon much of it is spoilt, with the result that only sufficient is kept from each year's crop to supply each year's needs.

37,922. You suggest the giving of a subsidy to cultivators in certain districts to grow heavy yielding fodder crops under irrigation. What fodder crops have you in view?—The ordinary millets, *juar* and *bajra*.

37,923. What pulses?—*Lohia* and *juar*.

37,924. Do you not think that the owners of cattle are disposed to trade too greatly on the hardiness of their live stock in this country?—I think they are. There would be fewer cattle if they were less hardy. In regard to cows it is undoubtedly a fact that the moment the cow goes dry she has to fend largely for herself.

37,925. Do you think it is reasonable to subsidise men to keep their own cattle alive?—You do not want the valuable stock to die; if they were given a subsidy and were encouraged to grow more fodder, they would keep alive their own valuable stock.

What would happen to you in Britain if you let your animals die for want of food? You would get no subsidy from Government!

37,926. *Rajah Sir Rampal Singh*: Have you tried to introduce the Janatpur breed in this Province?—No.

37,927. It is very popular, especially for draught purposes?—What is the distribution of the breed?

37,928. Janatpur, in Bihar. It is considered to be the best breed for draught purposes. Has no experiment been made with that breed?—Not in this Province.

37,929. For how long has this practice of giving bulls to District Boards been going on?—I think the first bulls were distributed in 1914 or 1915. Breeding operations started with the establishment of a farm in 1912.

37,930. I remember bulls being under District Boards in 1900?—That may have been organised by the Deputy Commissioner.

37,931. How long will it take to improve the cattle of these Provinces if only a *tehsil* is taken in hand as a controlled area?— I think, from our experience, using Hissar bulls as sires in the Etawah district, it will take about six years. A tremendous improvement has been brought about in many villages of that district in that period. To give you a concrete instance, I tried in that district to buy the male progeny of a very small cow, which had been covered by a Government Hissar bull. The value of the cow could not have been more than Rs.7, but I offered the owner Rs.75 for the calf by this bull and he refused the offer. That was rather an exorbitant price to offer, but I think the market value of the calf must have been at least Rs. 50.

37,932. How many bulls do you send out every year?—The number is rapidly increasing. This year we have sent out about 200.

37,933. It will take a long time before you succeed in improving the whole of the cattle in this Province by that method?—Yes.

37,934. 200 is nothing for a large Province like this?—That is so.

37,935. Do you not think steps should be taken to speed up the process?—Yes. I think the *taccavi* scheme we have started, and which is giving very promising results, should be widely extended. That would achieve the end we have in view in a very short time.

37,936. But you say you only sent out 200 bulls this year?—With this scheme more money will be available; the breeder will be financing the operations himself to a great extent, and it will soon be possible to send out 2,000 bulls a year.

37,937. *The Chairman*: Are you a trained chemist?—No.

37,938. What branch of agricultural training did you undertake in Germany?—I studied bacteriology.

37,939. Have you ever done any bio-chemistry?—Only sufficient to obtain the B.Sc. degree.

(The witness withdrew.)

RAI BAHADUR LALA ISHWAR SAHAI, Man Bhawan, Fatehpur.

Replies to Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) and (*b*) Fundamental research work should be carried on at the Central Research Institute and applied research work should be carried on in the Provinces under the guidance of the Central Research Institute so that the work may not overlap.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) No. For example, in our Province there is only one agricultural college, at Cawnpore, and an agricultural school at Bulandshahr. They are quite insufficient for the whole Province. In my opinion, a larger number of students would like to have agricultural education if it were provided conveniently.

(iii) Wherever available for practical work.

(iv) The attendance is not satisfactory because neither the students nor their parents know the advantages and value of scientific agriculture, and there are no prospects for them after receiving an agricultural education. The main idea of the people who receive education is to secure some appointment by that means, and there are very few people who acquire agricultural or any other kind of education for its own sake. The general idea prevailing here seems to be that no special education or training is necessary for *zamindari* or agriculture, and for this reason the attendance is not satisfactory.

(v) Generally to secure an appointment, and in rare cases to acquire a knowledge of agriculture for its own sake.

(vi) Very few pupils are drawn from the agricultural classes because in rural areas they have no idea about agricultural education.

(vii) The period of training at college for the present is four years and two years in schools, but the period can be appreciably reduced by curtailing the number of holidays that are allowed in the Agricultural College. The number of holidays allowed in the Medical College is quite sufficient for the students of the Agricultural College.

(viii) All these things will make agriculture more attractive to the students and will be most useful.

(ix) Almost all the students who have passed have taken a Government appointment, and those who have not yet succeeded are anxiously waiting for suitable opportunities to get in.

(x) By means of running successful demonstration farms and by making agriculture a compulsory subject in primary classes and optional in secondary schools.

(xii) By making primary education compulsory and by introducing part time and night schools by co-operative societies and other public bodies.

(xiii) Since the introduction of the Reforms and widening of the franchise, the uneducated zamindars and other people who have great influence in rural areas have got on to the District Boards and educated men who generally live in cities have very little chance of membership, e.g., in Fatehpur there are only two members who have received University education. Nothing can be expected from the uneducated and semi-educated members as regards the administration of schools, so the administration must be entrusted to the Education Department.

A certain fixed portion of the income of the District Boards should be allotted to rural education as the income of the District Boards is mainly derived from the labour of the cultivators.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) Successful demonstration farms run by private persons and co-operative societies are the best means of influencing and improving the practice of cultivators, because our conservative agriculturists will never like to change their old methods so long as they do not see the actual results of improved farming with their own eyes. For this reason the Government and the District Boards must give adequate help to people desirous of starting agricultural farms. By doing this a number of useful demonstration farms can be started in every district and tahsil. I had a scheme for this work, but, unfortunately, the Board of Agriculture of the United Provinces could not see its way to support it.

QUESTION 4.—ADMINISTRATION.—(*c*) (i) I am not satisfied with the Agricultural and Veterinary services, because they are understaffed.

(ii) The railways should provide adequate goods sheds and should charge lower freights for agricultural seeds and implements.

QUESTION 5.—FINANCE.—(*a*) Co-operative societies are the best source for the better financing of agricultural operations, but they can satisfy only the needs of men of limited means. For bigger operations such as sinking of tube wells and drainage Government should be more liberal. I think the *taccavi* system is injurious to the poor cultivators as they are never able to get the full amount of the money borrowed by them.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The cost of production has greatly increased. The expenses of cultivation are daily and monthly, whereas the return is only six-monthly and quarterly; so the cultivators have to borrow money for their daily needs. Litigation is another important cause of the indebtedness of the tenants.

(ii) Chiefly the village *mahajans*, and a small portion is supplied by co-operative societies.

(iii) Bad harvests; decrease in the average production per acre.

(*b*) Expansion of co-operative societies.

(*c*) In our Province the cultivators have not the right of selling and mortgaging their holdings except in the permanently settled districts.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—Under the existing conditions, the consolidation of holdings is very difficult and it can have no far-reaching effect, as even a nice consolidated holding cannot last for more than a generation and is bound to become subdivided unless the law of primogeniture is introduced in some form or other.

QUESTION 8.—IRRIGATION.—(*a*) (i) The Lower Ganges Canal which runs through the Fatehpur district irrigates only portions of the southern part of the district, and the rest of the district is left untouched. This portion also requires irrigation badly. If the canal is divided into two branches near Bindki it will be very useful, and a much larger area will be irrigated by this means. It may be objected that there will not be sufficient water for the two branches of the canal, but if the method which I suggest under the heading (*b*) (ii) is adopted, I am sure nearly double the present area will be easily irrigated by means of canal.

(*b*) (ii) When the canal water is not needed it is simply wasted. If this water may be allowed to fill up the tanks by means of canal distributaries it may serve a very useful purpose, and new tanks may be constructed at suitable places where this water may accumulate.

(iii) Cultivators and zamindars may be encouraged to build *pucca* wells jointly, because a well can very easily and conveniently be used by more than one cultivator at a time. Last year I induced a number of members of my co-operative societies to build *pucca* wells jointly, and long-term loans have been advanced to them.

The officers of the Canal Department have not any great regard for the needs of cultivators, and this is most probably due to their lack of knowledge of agriculture. So it will be advisable if they get some training in agriculture also.

(*b*) About 50 per cent. of the water of the canals is simply wasted because the cultivators have not the slightest regard for the economy of water. Generally flow irrigation is in vogue here and the cultivators simply let the water into their fields and they are over-flooded, with the result that excess of water damages the crops. If irrigation by means of lift is made compulsory, there will be no wastage of water, because no one will lift more water than is actully required. The water thus saved may be utilised in the new branch canal which I have suggested already.

At the tail-end of each and every distributary the Canal Department should try to have a tank or *jhil*, and if that is not possible the department should construct dams for this purpose. By this means the excess water which is generally let out into ravines will be accumulated and used by cultivators in times of need.

QUESTION 9.—SOILS.—(*a*) (i) Thousands of acres require drainage cuts in this district very badly. The introduction of canals has stopped the natural outlets in many places, so the work of drainage should be performed by the Canal Department and District Boards. It will considerably increase the area of culturable land, and this, too, will be irrigated by canals, and thus the income from irrigation will also increase.

(ii) Alkali tracts can be improved by sowing wild leguminous plants and by making ridges to accumulate water in those tracts. I have succeeded in converting hundreds of acres by this means, and at present I am doing this work in the districts of Lucknow and Fatehpur.

(iii) Erosion can best be prevented by making strong ridges.

(*b*) In my own villages in the Fatehpur district I have succeeded in converting hundreds of acres of alkali land by sowing *babul* and other leguminous plants.

(*c*) I do not think it is needed, at least, in my district, because such plots provide fodder which is becoming more and more scarce.

QUESTION 10.—FERTILISERS.—(*a*) The use of natural manures as well as artificial fertilisers is very desirable, but natural manures are much more suitable for a poor country like India. The supply of natural manures can be greatly improved by using wood for fuel instead of cowdung cakes.

(*c*) Demonstration farms are the most suitable means for this purpose.

(*d*) Not in my district.

(*f*) Plantations of *babul* and other quick-growing trees should be encouraged.

Rai Bahadur Lala Ishwar Sahai.

QUESTION 11.—CROPS.—(*a*) (i) It can be done by better tilling, manuring and selection of good seed.

(ii) New fodder crops should be investigated and the Government farms should supply the seeds wherever possible and they must be advertised. Experiments should be made in Government farms to find out the most successful crops. The Agricultural Department may publish small leaflets about them and distribute them to the general public. Special attention should be paid to research on drought-resisting fodder crops and those that may be grown in the dry season.

(iii) As far as possible this work should be done by the co-operative societies.

(iv) In this district the wild animals are not in very large numbers, but monkeys are in very large numbers, and they cause very great damage to agriculture, so they should be exported to hilly tracts where there is vegetation but no cultivation. I have referred this matter to the United Provinces Board of Agriculture.

QUESTION 12.—CULTIVATION.—(i) The existing system of tillage is very defective, because the country plough simply tears the land and does not overturn it, which is very essential. Proper tillage can be achieved by using improved ploughs at the proper time.

(ii) The ordinary cultivators sometimes sow a number of crops together which is undesirable and should be discouraged. They generally know well the advantages of rotation of crops.

QUESTION 14.—IMPLEMENTS.—(*a*) Indian cultivators are generally very poor and their holdings are very small, so it is useless to try to introduce costly and complicated machinery among them, but a great deal can be done by way of improving the existing implements. They can be easily introduced through co-operative societies, and in my district societies have purchased machinery which they lend to their members.

(*b*) The chief difficulty in the adoption of new implements and machinery is their high cost, but the Indian cultivators will readily adopt cheap and useful implements when they see them being worked in demonstration farms.

QUESTION 15.—VETERINARY.—(*a*) There is no harm if the Civil Veterinary Department is brought under the control of the Director of Agriculture.

(*b*) (i) In our Province the dispensaries are under the control of the District Boards and nothing can be worse than this arrangement.

(ii) Certainly not. Since we have had non-official Chairmen in our District Boards there has been absolutely no expansion. Things are getting worse and worse every day.

(iii) Certainly, because the District Boards have hopelessly failed to perform their duties and they should be placed under the control of the provincial authorities as early as possible.

(*c*) (i) It is physically impossible for agriculturists to make full use of the veterinary dispensaries as, in a district like Fatehpur with an area of about 1,600 square miles and containing about 5 lakhs of cattle, there are only two dispensaries and they exist only in name as when necessity arises they cannot supply any medicines.

(ii) There is no touring dispensary in this district. It is highly desirable that there should be at least two touring dispensares in each district. During the last three months several thousand cattle have died of rinderpest and hæmorrhagic septicæmia in this small district of Fatehpur and the local dispensaries hopelessly failed to be of any use.

(*d*) Sometimes the ignorant cultivators object to inoculation but this objection can be easily removed if there are touring dispensaries and the cultivators see the effect of proper treatment. Most of them have no idea that there are ways and means by which epidemics can be checked and their cattle saved. Most of them regard epidemics as being due to the wrath of

the Gods and think that they can be averted by means of alms and prayers. But practical results will help to convince them.

Certainly, legislation will be useful. Failing legislation, practical experience is the best means of improving the existing conditions.

(*e*) During the last epidemic of rinderpest and hæmorrhagic septicæmia we could not get any serum for my co-operative societies though I was willing to pay for it.

(*f*) The ignorance of the cultivators is the chief obstacle and absence of dispensaries both local and travelling makes it impossible for them to get acquainted with the benefits of inoculation.

(*g*) It is desirable.

(i) & (ii) Both of these are desirable.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Bulls of good breed should be distributed to the public.

(ii) I started a dairy in Fatehpur city some time ago but I did not succeed as I could not compete with people who sold adulterated milk at much cheaper rates; so in my opinion legislation is necessary to protect the dairy Industry. This work can be greatly improved by means of co-operative societies which may borrow bulls for the use of members as well as non-members, from the Agricultural Department. This year the Deputy-Director of Agriculture in charge of Cattle Breeding Operations, has very kindly lent half a dozen bulls to our societies for this purpose.

(iii) Breeding farms should be started along with Government agricultural farms so that pedigree bulls and heifers may be available in sufficient numbers.

(*b*) Certainly; these are the chief causes of injury to cattle in this district.

(*c*) Fodder is very scarce from the beginning of February to the middle of April, and from the middle of June till the middle of July, that is, for about 14 weeks in the whole year. Within three or four weeks of the expiry of these periods young growing cattle begin to thrive.

(*d*) Fodder supply can be greatly improved by making silopits and preserving and storing hay.

(*e*) Land owners cannot be induced to move forward in this matter unless the Government is ready to support them.

QUESTION 17.—AGRICULTURAL INDEBTEDNESS.—(*a*) In my district the average cultivator works on his holding all through the year, with the exception of the months of June and February when there is not much work to do in the fields, but he repairs his house at that time.

(*b*) Dairying and poultry-farming can be conveniently done by farmers along with their cultivation. A successful demonstration of these things will have a very useful effect.

(*c*) Bee-keeping is not known in this district. Poultry farming is not considered very dignified. Fruit growing offers no obstacles but sericulture and pisciculture are not known here. Lac culture is also not known here. Rope making and basket making are done here. There is very little demand for fruits in rural areas. Still, zamindars are paying greater attention to it.

Small leaflets, in simple vernacular, describing the means and methods of following the above-mentioned industries together with the approximate income and expenditure from them should be published by Government and distributed to the general public gratis or at nominal prices.

(*d*) Yes. Small pastures should be started for these works with the help and aid of Government. The most urgent need of the peasantry of India is that its raw products should not go out of each district before being manufactured to some extent.

Big factories are not needed in our country at present, but small factories are badly needed. I prepared a scheme for the organisation of such a

society but unfortunately it was rejected by the Registrar of Co-operative Societies.

There are a number of things which are simply wasted or burnt at present like hemp stems after the separation of fibre, and a number of water weeds and grasses which might be used for making paper pulp, and some indigenous seeds as well from which oil could be extracted, but no attention is paid to them. Special research may be made into these possibilities.

(*e*) Yes. If small factories for the manufacture of raw produce are started in rural areas they can certainly provide employment for a number of men.

(*f*) Yes; e.g., finding out a suitable appliance for the extraction of hemp fibre.

(*g*) Manufacturing of raw produce like the husking of rice, making of dal, etc., can lead to greater rural employment.

(*h*) Compulsory elementary education is the only means by which people can be induced to devote their spare time to improving the health condition of their surroundings.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) & (ii) The proprietors of land should provide special facilities to the labourers so that they may emigrate to places where they are wanted. The chief causes of the shortage of agricultural labour is that the agriculturists do not employ daily labourers throughout the year.

(*b*) The people of this Province are not at all enterprising. They are very contented and do not like to leave their houses even if they have a remote chance of inheriting land, it may be only an acre. So in my opinion some change in the law of inheritance is necessary.

QUESTION 19.—FORESTS.—(*b*) By planting quick growing plants on the sides of the roads and waste lands.

(*d*) Yes. There is necessity of afforestation and certainly it would stop erosion in the neighbourhood of villages.

QUESTION 20.—MARKETING.—(*a*) No. There is only one big grain market in my district at Bindki but the roads connected are in a very deplorable condition. The roads should be properly kept and some new roads should also be constructed.

(*b*) The existing market facilities are very unsatisfactory. But it is impossible to make any great improvement until the general education of the rural population improves; only then can co-operative sale be successfully introduced.

One of the great drawbacks is the multiplicity of weights and measures as in almost every big village the weight of the *Panseri* (five seer weight) varies; it goes from five standard seers to almost nine. In this way it is very easy to cheat poor and ignorant cultivators.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—There should be no custom duty on hides.

QUESTION 22.—CO-OPERATION.—(*a*) (i) The Government should try to employ only those officials in the Co-operative Department who have the real spirit of co-operation in them and who may be able to teach the non-officials how they should work in the cause of co-operation. More attention should be paid to sound organisation and adequate supervision than to the rapid expansion of the movement. They should work in a missionary spirit and not as executive officers of the Government.

(ii) The non-officials should be encouraged to take a keener interest in the movement and they should be treated with due courtesy. The effort of the department should be to teach them how to carry on the work and guide them and not to spend its whole time in finding fault with their work.

(*b*) (i) Credit societies are doing fairly well but there is very little co-operative education among the members and the real spirit of co-operation is lacking. It can be greatly improved by imparting general education to the members.

(ii) Purchase societies require a great and up-to-date knowledge of business.

(iv) There is no need of forming fresh societies of this kind as the credit societies can serve this purpose well and in the Fatehpur district they are doing the work properly.

(vii) Some of the old and strong societies are doing this work in the Fatehpur district on a small scale.

(viii) Such societies are only suitable for those places where there are sufficiently large grazing areas.

(ix) I framed bye-laws for a Better Farming Society, but unfortunately they were not approved by the late Registrar and I dropped the matter.

(*c*) In my opinion it is not desirable.

(*d*) Yes, they have achieved their object to some extent.

QUESTION 23.—GENERAL EDUCATION.—(*a*) The existing system of education is not satisfactory. In my opinion the agriculturists should not be required to attend classes from 10 to 4 p.m. Elementary education should be made compulsory, but the hours of teaching should be between 12 noon and 2 p.m. Two hours a day for elementary education are quite sufficient; one hour for reading and writing and one hour for arithmetic. The chief reason why the agriculturists are afraid to send their boys to the village schools is that the boys will not be able to help them in their work.

In 1910 I made education compulsory among the members of my co-operative societies and all the members used to go and read. Mr. (now Sir S. H.) Fremantle, the then Registrar, had told me that we would get aid from the Education Department, but later on I was told that no aid could be given so long as the school curriculum was not regularly followed.

In these schools education was given only for two hours, from 1 to 3 p.m. I had to close these schools for want of funds.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) At present agriculture alone is not very paying and the margin of profit is very narrow; so it is difficult to induce a larger number of men of capital and enterprise to take to agriculture. Besides that, agriculture requires very close supervision and hard work, so people hesitate to take up this profession. But, if by means of demonstration farms and by introducing other branches of agriculture like dairy farming, poultry farming, horticulture and market gardening and cattle breeding successfully, their benefits are shown, people are bound to take up this profession because all the other professions are overcrowded. There is a great scope and great future before agriculture and young men will take it up when they find no other work which is more paying.

(*b*) Ignorance, short sightedness and a fear of an increase in land revenue are the chief factors which are keeping back the owners of agricultural land from carrying out improvement.

QUESTION 25.—WELFARE OF THE RURAL POPULATION.—(*a*) Caste prejudice is one of the causes of the wretched condition of the peasantry. Although the question of untouchability is not very strong in this Province, low-class people like Chamars, Pasis, Khaticks and others are not treated properly. In almost every village we find the worst locality occupied by the low-class people who are not allowed even to draw water from good *pucca* wells. The result of all this is that they are the easiest victims of the various epidemics like cholera, malaria, influenza and plague. The rate of mortality among these people is also greater, with the result that the scarcity of labourers is being keenly felt in villages now. So the zamindars should be forced to give good land to low-class people for building houses and for wells.

It is an admitted fact that India is one of the poorest countries in the world. The low standard of living of the vast majority of its people is well known. It is a pity that with such a vast culturable area and with the majority of its people living on agriculture, they are so ill-fed, ill-clad and ill-housed. Many of the educated Indians, and even some Englishmen, have ascribed this abject poverty to the huge economic drain from this country, due to foreign rule. But I do not agree with them. If we study this interesting problem more deeply we will find that we ourselves are not free from blame and we can improve our condition to a great extent by our own effort.

The chief reason for our poverty is the blessed habit of contentment. We are satisfied with whatever we get and the spirit of enterprise is almost totally dead in us. The majority of the rural population want to stick to their homes and are most unwilling to leave their villages unless they are compelled to do so. They prefer to reduce their expenditure and lower their standard of living to going to some other place and adopting some other profession.

Our laws of inheritance are greatly responsible for this state of affairs. Take the case of the majority of the zamindars or cultivators of these places. The sons of farmers or of the majority of the zamindars do not dream of taking up any independent profession. They think that they have got something to fall back upon and they must inherit something after some time so they need not exert themselves to learn a profession. The result is that they continue to rot in their native places. We see a number of cultivators who have hardly got one full acre of occupancy holding. They take sub-leases of small holdings from other cultivators at high rents, with the result that their condition is growing worse every day. In the same way we see holdings of the families of big zamindars dwindling into petty *zamindaris* of annas and pies. So it is highly essential that suitable remedies should be found.

England would have never been so great if its early inhabitants had thought fit to stick to their homes. What is needed in us is the spirit of enterprise and adventure, and this can be greatly brought about if the law of primogeniture is introduced everywhere and only the eldest son may succeed to the landed property of his father. Then, and only then, will the other sons think of adopting independent professions and of increasing their incomes by immigrating to other places. It can be seen everywhere and every day that those people who have chosen to leave their homes and settle elsewhere are much better off. The law of inheritance seems to be the fundamental cause of the poverty of our country, and it has killed the spirit of enterprise and adventure in us.

APPENDIX.

Copy of a letter, dated, Fatehpur, April 16, 1926, from Rai Ishwar Sahai Bahadur, Chairman District Co-operative Bank, Limited, Fatehpur, to the President, Board of Agriculture, United Provinces (through the Magistrate and Collector, Fatehpur, and the Director of Agriculture, United Provinces).

"Herewith I beg to forward to you a copy of the scheme which the Board of Directors of the District Co-operative Bank, Limited, Fatehpur, passed at their quarterly meeting held on April 12, 1926, for your favourable consideration and orders."

Co-operative Agricultural Demonstration Farms.

As the real aim and work of the co-operative societies can never be completely achieved without improvement in agriculture and both must

go hand in hand to effectively improve the condition of the cultivators, it seems absolutely necessary to start a number of co-operative agricultural demonstration farms along with the co-operative societies, under the guidance and supervision of the secretaries and other officials of the co-operative societies who may have received adequate training in the improved methods of agriculture.

A beginning was made in this direction by the Fatehpur District Co-operative Bank last year by starting three farms at Fatehpur and at the villages Behta and Chak-askaran, after consulting the Director of Agriculture, United Provinces, who very kindly lent the services of a Fieldman to our district bank. But the work was begun very late as we got the Fieldman in the month of October, 1925. The farms, too, could not be run wholly on co-operative lines as they were under the sole management of three of the Directors of the district bank. Besides that, we found it difficult for one Fieldman to supervise three farms at a distance of about 14 miles from each other.

For these reasons the Directors of the district bank formulated the following scheme at their last quarterly meeting, held on 12th April, 1926, for starting model co-operative agricultural demonstration farms:—

At present there are 75 rural co-operative societies in this district scattered in all the three tahsils. It is proposed to have 8 demonstration farms in this district, two in *pargana* Fatehpur, two in Haswa, two in Aya-shah and two in Bindki.

To supervise these farms we must have at least one Inspector and four Fieldmen. The former should be a B.Ag. and the latter must have at least passed the two-years' course of the Cawnpore Agricultural College. The duties of these Fieldmen and the Inspector will include the secretarial and inspection work of the co-operative societies as well, and we think these duties can be combined without any difficulty. All the expenses of the farm, except the pay of the Inspector and the Fieldman, will be borne by the members of the societies who will start the farms, and the profits will also go to them. The farms will be run by some members of the co-operative societies jointly and, where it is not possible, by individual members. The farms will be located in the best possible situations so that all the members of the co-operative societies, as well as outsiders, will be able to see their working and will be allowed facilities for learning things and getting supplies of seeds and implements through the farms.

As the initial expenses connected with this scheme will be too much to be borne by the district bank or the societies concerned, Government aid to the following extent is absolutely necessary:—

The Government should be requested to pay at least Rs.300 for each farm for the purchase of necessary implements, and also the full pay of the Inspector and the Fieldmen in the first year, three-quarters of the pay in the second year, half in the third year, and one-quarter in the fourth year. In the second and subsequent year the balance of the pay will be paid by the district bank because by that time the Inspector and the Fieldmen will have learnt to supervise the work of the societies also. We hope that in four years' time they will be thoroughly acquainted with the bank work and will be able to take the places of some of the members of our present staff. During this period the proprietors of the farms will also be in a position to contribute something towards the pay of the men who will supervise their farms.

The following is a rough estimate of the amount of money which will be required for this purpose, and we hope that the Board of Agriculture will kindly agree to give us the necessary amount.

Rai Bahadur Lala Ishwar Sahai.

The pay of the Inspector will be between Rs.75 and Rs.100, and that of the Fieldman between Rs.40 and Rs.50. The average pay of the Inspector will be Rs.90 per month, and that of each Fieldman Rs.45 per month.

	Rs.
Initial grant of Rs.300 for eight farms	2,400
Pay of one Inspector and four Fieldmen in the first year	3,240
Pay of one Inspector and four Fieldmen in the second year	2,430
Pay of one Inspector and four Fieldmen in the third year	1,620
Pay of one Inspector and four Fieldmen in the fourth year	810

Oral Evidence.

37,940. *The Chairman*: Rai Bahadur Lala Ishwar Sahai, you have provided us with a note of the evidence you wish to put before the Royal Commission. Is there anything you wish to say in addition to that, or are there any corrections you would like to make?—I saw from the Questionnaire that questions affecting revenue were not to be dealt with, and so I did not say anything on that subject; but I see from his evidence that the Revenue Secretary has touched on it, so I would like to bring to your notice the real condition of affairs in my district.

37,941. We are quite prepared to hear your views in that direction up to a point?—I merely wish to put in this report. (*Document handed in.*)

37,942. This is entitled "Government Gazette of the United Provinces of Agra and Oudh, Saturday, July 22, 1916, Part VII," and you have marked page 747. Do you wish to say anything further about this?—No, I merely wish to bring it to the notice of the Commission.

37,943. If you will leave it with us, I will have it put on the Members' table. There are one or two points in your note I should like to clear up. In your answer to our question on agricultural education, you give it as your view that a larger number of students would be prepared to take advantage of any increased facilities for agricultural education?—Yes.

37,944. But elsewhere you say, "The attendance at these classes is not sufficient because neither students nor their parents know the advantages of scientific agriculture, and there are no prospects for them after receiving agricultural education." Do you think that the last fact (if it is a fact) suggests there is any demand for increased facilities?—There ought to be more schools, yes. When there are more schools in different districts more people will get to know their value.

37,945. In answer to our question on agricultural indebtedness you say there has been a decrease in the average production per acre?—Yes.

37,946. On what do you found that view?—My own experience is that we are not having the yields we used to get.

37,947. For how many years does your accurate recollection of farming on the same land carry you back?—About thirty.

37,948. Are you prepared to tell the Commission that the yield from that land is less now than it was thirty years ago?—Yes.

37,949. Can you give us exact figures, or are you speaking from general impressions?—From general impressions.

37,950. *Sir Thomas Middleton*: Has the land become salt?—No. In some places where there is canal irrigation it seems to be a little alkaline.

37,951. *The Chairman*: Dealing with irrigation, you say that if lift irrigation were made compulsory there would be no wastage of water. It is, of course, a fact that where cultivators have to expend their personal labour

in lifting the water they are more careful how they use it, but I take it you would not suggest that all flow irrigation should be stopped?—I think so, because the more water we can save for irrigating other land the better.

37,952. You think it would be a practical and useful step to do away with all flow irrigation and to arrange for the cultivator to lift the water to his land by his own or bullock power?—Yes, or by small pumping plants.

37,953. You say on the same page that alkali tracts can be improved by sowing wild leguminous plants and by making ridges to accumulate water in those tracts, and you say you have converted hundreds of acres by these means and are at present employing them. Can you give us further details? Was this land definitely salt?—Yes.

37,954. What wild leguminous plants did you sow?—*Babul*, and a small plant called *Chakauri*.

37,955. They will grow on alkali land?—Yes.

37,956. Did you think of inviting the Agricultural Department to witness these experiments?—Mr. Moreland has seen them.

37,957. Did you undertake this work on your own initiative or at the suggestion of the department?—When he was on tour in the district he saw it; that is all.

37,958. On page 470, you refer to the possibility of extending the activities of the Co-operative Department in this Province to cattle breeding. Are there any cattle-breeding societies in your district?—No. I have had bulls on loan from the Agricultural Department and distributed them.

37,959. Have you taken an active part in the co-operative movement?—Yes. I think I was the first man in all India to start rural co-operative societies.

37,960. What is your connection with the movement at the moment?—Now I am Chairman of the Board of Directors.

37,961. On page 472, Question 23 (*a*), you point out that you succeeded in making education compulsory in one of your societies?—Yes.

37,962. That must have been rather difficult? How do you compel the members of a co-operative society?—I told them that they must join the schools at a convenient time.

37,963. On page 473, you make an interesting proposal for co-operative agricultural demonstration farms. I think this scheme was considered by the Provincial Board, was it not?—Yes.

37,964. With what result?—I am a member of that Board, but I am sorry to say I could not attend that meeting.

37,965. So that your advocacy was lacking and your recommendation was rejected, was it not?—Yes.

37,966. Is it your view that such demonstration farms could be conducted at a profit, or at any rate without loss, or would they cost a certain amount?—At the beginning they would cost a certain amount, but not in two or three years.

37,967. You think ultimately they might be self-supporting?—Yes.

37,968. I note that you advance certain proposals for zamindars' co-operative mills and credit societies?—Yes.

37,969. And also for co-operative better-farming societies?—Yes.

37,970. I think you went so far as to formulate the by-laws. Did you yourself draft those by-laws?—Yes.

37,971. Did you submit those to the Registrar of Co-operative Societies in this Province?—Yes.

37,972. What was the result?—The zamindars' co-operative mills and credit societies and the better-farming societies were rejected by the Registrar; but the new Registrar visited Fatehpur this month; he quite agreed with me, and said he was ready to approve the by-laws.

37,973. Has he approved them yet?—Yes.

37,974. He has approved them in writing?—No, not in writing, but he has discussed the matter with me and cleared away all the matters of doubt entertained by the late Registrar, and he has said they are all right, that he agrees with me, and he has suggested my sending in a formal application for registration. I am going to do that.

37,975. But you have not heard from him yet to say that he definitely reverses the decision of his predecessor?—No, but he promised to register them.

37,976. So you understood?—Yes.

37,977. *Sir Thomas Middleton*: You point out that fodder is very scarce in certain periods of the year?—Yes.

37,978. You have told us that by exercising a little judicious authority you have produced compulsory education. Do you think you could induce people to make silage and to store fodder in your area?—But I do induce them and they do collect ample fodder, when there is ample.

37,979. It is scarcity of fodder that is the trouble?—Yes.

37,980. You point out that the chief reason for the poverty of the people is the blessed habit of contentment. Does not that also apply to their treatment of the cattle? They are content with what nature gives?—Yes.

37,981. *Raja Sir Rampal Singh*: You want to abolish the control of the District Board over primary education?—Yes, and have it under the Education Department.

37,982. Do you think that will be advantageous?—Then somebody will take care of it; now the District Board takes no care.

37,983. *Sir James MacKenna*: I understand there are religious objections to killing monkeys in India?—Yes.

37,984. So that you would have to deport them?—Yes, I think so.

37,985. I understand a dead monkey is more valuable than a live one in some countries; have you heard that theory?—Yes, it may be.

37,986. But, of course, there would be religious objections to killing them in India, I think?—Yes. That religious objection does not prevail in Burma.

37,987. *Mr. Kamat*: You have said in your memorandum that a change in the law of inheritance is necessary?—Yes.

37,988. And that the present law is the fundamental cause of the poverty of the people?—Yes, I think so.

37,989. Do you think the time has come to have this radical remedy in India?—Yes, I think so.

37,990. If out of four or five sons the eldest only inherits, are there occupations, other than the land, for the other sons?—Yes, there are.

37,991. You think there are enough occupations in India, other than agriculture, for the rest of the population?—Yes, there are.

37,992. And such a proposal would not evoke any serious opposition from the general public?—It may do so, but it is necessary, I think.

37,993. You still think the legislatures or Government should undertake this change in the law of inheritance in the immediate future?—Yes, I think so.

37,994. *Sir Ganga Ram*: How much land have you got?—I have got a few villages, but my own cultivation is in two villages.

37,995. How many acres are there in your total property?—I cannot tell you the number of acres; it may be about 50,000 acres.

37,996. Of which, how much is canal irrigated?—Only two villages are canal irrigated.

37,997. Is there the possibility of a new canal being constructed there?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Friday, the* 11*th February*, 1927.

Friday, February 11th, 1927.

CAWNPORE.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai BAHADUR SIR GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S., Raja Sir RAMPAL SINGH. } (*Co-opted Members.*)

Mr. J. A. MADAN, I.C.S., Mr. F. W. H. SMITH. } (*Joint Secretaries.*)

Mr. C. Y. CHINTAMANI (Editor, The Leader) Allahabad.

Note on Agriculture under the New Constitution.

I am not an agriculturist. My knowledge of the subject is derived from occasional study in the course of a publicist's life and supplemented by what I saw as Minister of Agriculture in the United Provinces for 28 months.

No action that the Government of India may take is likely to be of much service to agricultural improvement in the Provinces, owing to the conditions of the Constitution. The one big exception to this statement is the maintenance by them of an institution like the Pusa Research Institute. Agriculture being a Provincial and Transferred subject, action has to be taken by "Governors acting with Ministers." A sympathetic Governor, a liberal Finance Member, a capable Minister, a wise Legislative Council, and a head of the department willing to work in harmony with the Minister and the Council: these are the necessary factors so far as the State is concerned. It goes without saying that adequate funds should be provided year by year. I am of opinion that the resources of the United Provinces Government are inadequate to their requirements. The financial relations between the Central and Provincial Governments call for revision so as to leave to the latter resources commensurate with their responsibilities. It is in this direction and not in the form of grants or subventions that in my view we should look to the Central Government for relief. As things are, I think it should be possible for our Provincial Government to make increased allotments for agriculture by the observance of economy (chiefly) by the Governor in Council in the Reserved sphere. I have little doubt that the Legislative Council will vote larger demands for grants if it is satisfied that the money will be wisely spent. The Council was severely critical when I was Minister. It was rightly so. Under that stimulus we were able to reduce wasteful and unprofitable expenditure, to enforce economy, and to reform policy in relation to demonstration farms and gardens, while deficiencies in the staffing and equipment of the College of Agriculture were supplied, the School of Agriculture at Bulandshahr was opened, the agricultural engineering branch was strengthened, the two cattle farms in Muttra and Kheri were placed under the department, and more Indians

were appointed to high offices in the department. We decided to open another agricultural school in the eastern districts and to increase the number of Circles under Deputy Directors, but were held up for want of funds. Further, it was decided on the unanimous recommendation of a strong committee presided over by the then Senior Member of the Board of Revenue and including the Directors of Agriculture and Public Instruction, to make the College of Agriculture a University institution, and we were planning steps for the training, partly at the College and partly at the Government Botanical Gardens at Saharanpur, of Indians for the positions of Superintendents and Overseers of gardens. I do not know that anything has since been done in the furtherance of these objects. Nor do I know the reason why.

The point I wish to emphasise is that Agriculture should be, in name and in reality, a matter for Provincial Governments responsible to Provincial Legislatures, that it should be so more than at present, and that its development will be best helped by the provision of adequate funds out of provincial revenues and to be voted by Legislative Councils and not by the transfer of control, in any manner and to any extent, to the Central Government.

Arrangements for research should be made, and in my view can be made in the Provinces.

I am glad that there is to be no more recruitment for the Indian Agricultural Service under the control of the Secretary of State. Provincial Governments should be the authorities to determine what posts should be created or maintained, how they should be recruited for, and what should be the conditions of salary and service. If suitable men cannot be had in India, they will naturally try to get them from abroad for such work, for such periods and on such terms as they may deem fit. As the Government will be responsible to the Legislative Council the latter is not at all likely to assume an attitude of hostility. Trust it, inform it, argue with it, and it will be responsive and helpful. While it has been severe in criticism of extravagant and unfruitful expenditure, it has been loud in complaining of inadequate outlay on so vital a subject.

Irrigation, Loans to agriculturists for purposes of agriculture, and Forests should be transferred to the control of Ministers. I do not believe a word of the allegation that efficiency will thereby suffer. Appoint competent men as Ministers, and let them do their work with the support of the Legislative Council, and they can give as good an account of themselves as Members of the Executive Councils. In these Provinces as well as in Bombay and the Punjab Ministers were translated to Executive Councils. In their present positions they have charge of certain subjects. Would they have been unfit to look after them as Ministers? Owing to the absurdities of the Constitution they would have been held to be so. The attitude of the Legislative Council demonstrates that it would be more friendly to Transferred than to Reserved subjects as it can then exercise some control over policy, expenditure and administration.

Oral Evidence.

37,998. *The Chairman*: Mr. Chintamani, you are good enough to appear before us this morning. We have a note from you for which we are obliged. Would you mind telling the Commission what positions in public life in this Province you have held which have given you an insight into agricultural matters?—I have been Editor of a daily paper for the last 17 years. I was a Minister for a little over two years. I have been connected with various public organisations. I cannot say they are positions which gave me an insight into agricultural problems in particular but generally into public questions.

37,999. So you have viewed agriculture as a man generally interested in public affairs and in the public welfare?—Yes.

38,000. I wanted to ask you one or two points on that branch of our subject which seems to specially interest you. You are impressed, I understand, by the value which Pusa has rendered as a Central Institute for agricultural research, is that so?—Yes.

38,001. You think Pusa has done good service?—I think so.

38,002. Have you considered at all the problem of post-graduate training for agricultural officers in India?—The training can be imparted in Pusa as well as in provincial institutions.

38,003. Is that a subject to which you have applied your mind?—Not in particular.

38,004. You probably agree that the quality of teaching required for post-graduate courses must necessarily be a high one?—Yes.

38,005. You probably agree also that the association of higher teaching with research is of mutual advantage?—Yes.

38,006. However, you yourself, as do most other people, accept the present position following on the Reforms according to which the Provincial Government is responsible for agriculture and normally under the Constitution agriculture is a subject transferred to a Minister responsible to the local Legislature?—Yes.

38,007. And you argue from that, I understand, that in the main development in research and in propaganda must be under the control of Local Governments?—Yes.

38,008. And you think that there are still certain directions in which further saving of public revenues might be effected with a view to diverting that revenue to agricultural matters?—Yes.

38,009. Do you live in the country at all yourself?—No.

38,010. Have you studied the co-operative organisation?—Yes, in the same manner as agricultural matters.

38,011. Have you formed any view about the state of the co-operative movement in the United Provinces?—Yes; it is not quite satisfactory.

38,012. But we hope these ailments are passing and that the future may be brighter?—I should think so.

38,013. Have you formed any view as to the extent to which the co-operative principle may further the interests of agriculturists in the Provinces? Have you studied the problem?—There must be more co-operation between the Co-operative Department and the Department of Agriculture than there is a present. Lately the Local Government appointed a committee to go into the whole question and make recommendations. I understand that the committee's report is now under the consideration of the Government. One respect in which the Co-operative Department has suffered is that the appointments to that department have to be made from the Revenue Department. The Registrar, the Deputy Registrar and the two Assistant Registrars must be revenue officers, either I.C.S. Officers or listed post holders or Deputy Collectors. None of them is ever taken from the Department of Agriculture, and it is not open to the Local Government to go outside the Revenue Department to make the appointments. Whether the men are satisfactory or not they have to be taken from the Revenue Department. I think there should be less departmentalism and the Government should not be tied by rules made in the interests of particular services.

38,014. *Sir Henry Lawrence*: What are these rules?—They are that the Registrar and the Deputy Registrar must belong either to the I.C.S. or must be holders of listed posts.

38,015. Who has made those rules?—The Secretary of State. Also that the Assistant Registrars, I do not know by whom this rule was made, must be Deputy Collectors.

38,016. These rules appertain to this Province, do they?—I think in other Provinces too the Registrar is an I.C.S. man or the holder of a listed post.

38,017. Can you refer us to any such rules made by the Secretary of State?—I have not got the text of the rule with me. But I can tell you the things as they exist here. When they created the post of Deputy Registrar, they announced to the Legislative Council that the post was reserved for members of the Indian Civil Service. It was in 1921 that the Secretary of State sanctioned the listing of these two posts. Since then it has been said that provided two other posts are given to Deputy Collectors who are "listed" these two posts may go to the I.C.S. At all events no one outside the I.C.S. or P.C.S. cadre has ever got the posts, and under the existing practice, based upon rules, no one else can be appointed.

38,018. *The Chairman*: We can very easily get precise information from either the Government or the department concerned?—I may say that when I was Minister I wanted to appoint, as Assistant Registrar, a non-official gentleman who has done particularly good work in the co-operative movement, but I was told that I was not at liberty to go outside the ranks of Deputy Collectors.

38,019. Have you had experience of local authorities in this Province?—I have not been a member of the local bodies, but the same observation holds good; I have been a student of their affairs as of other affairs.

38,020. What is your view of these District Boards as an instrument for controlling education?—It is not very satisfactory as they are.

38,021. Why not?—In the first place they are not expert bodies; in the second place the District Boards have come under non-official control only recently, during the last three or three and a half years.

38,022. Most of these District Boards have educational sub-committees?—They have.

38,023. Have you ever considered the possibility or the advisability of Government having the power to nominate certain persons in the district to the educational sub-committee?—I do not think there will be any advantage in that.

38,024. You do not think that might strengthen the educational sub-committee?—The committee may be given power to co-opt.

38,025. *Sir Henry Lawrence*: Have not they got that power now?—I am not quite clear about it.

38,026. *The Chairman*: Do you think that the educated Indian living in urban surroundings and the great cities in this country understands the rural problem?—Fairly, but not with the thoroughness of an expert.

38,027. Do you think that more might be done in Universities, for instance, to encourage interest in rural economics?—Yes, I think so.

38,028. Would that be an important contribution to public life?—Yes; and I must say that in recent years much more attention has been given to economics by Universities and this has been very fruitful in producing very capable men.

38,029. *Sir James MacKenna*: Just one point on a matter of administration as you have been a Minister. You are aware of the Central Cotton Committee in Bombay, and you know the way in which it finances or assists an enquiry in the Province? The point was put by one witness that there was a certain danger in this, in that the Minister might rather object to a grant for a particular object in which he and the Legislative Council have

no final say. Do you think there is anything in that?—As the Local Government does not spend the money, and the money comes from outside, I do not think any objection has arisen so far. At all events, no such question has arisen here.

38,030. That point was raised as probably being a theoretical difficulty?—So far as my knowledge goes, it is merely theoretical; there has been no practical difficulty so far.

38,031. *Mr. Kamat*: You are against the principle of receiving any assistance from the Government of India for agricultural improvements in the Province?—Yes.

38,032. Is that because you are afraid of the control or interference by the Government of India, or is it due to any other principle?—It is partly because there is the fear of interference or control and also partly because it does not fit in with the system of provincial autonomy towards which we are working and with the present system of financial relations between the two Governments.

38,033. You say that the financial relations call for a review; can you briefly indicate in what directions the revision should take place?—The Local Governments should have more revenues raised in the Province for expenditure in the Province than is at present the case.

38,034. If the Province reaches the limit of exploring the avenues of raising funds and if the Government of India can help, are you still against that help?—If there are Provinces which have reached the limit of taxation, and if the maximum revenue that can be raised on the present basis is inadequate for the requirements of those Provinces, that is a case more for the revision of financial relations between the two Governments, for a reconsideration as to which source should be Provincial and which All-India, than for special subventions or grants.

38,035. Under the present arrangement there is the Board of Agriculture and there is also the Agricultural Adviser to the Government of India? As an ex-Minister can you tell me from your own experience whether you had anything like interference from the Agricultural Adviser, or whether you had any recommendations of the Board of Agriculture sent to you which were in the nature of interference in local affairs?—Nothing was done which could be called interference. I do not remember any advice being received from the Agricultural Adviser to the Government of India during the time I was in charge of the Department; nor even from the Board of Agriculture. But a recommendation of the Board of Agriculture made before the introduction of the reformed system of Government was still pending consideration at the time the new system was introduced and that recommendation was one with which I agreed on its merits; but since then effect has not been given to that particular recommendation of the Board of Agriculture in spite of the efforts to the contrary.

38,036. *Sir Henry Lawrence*: What was the recommendation about?—The recommendation was that, just as is done in Bombay and elsewhere, the agricultural colleges should be made University institutions, and degrees in agriculture should be instituted.

38,037. You tried to get that done and you did not succeed?—Yes, I tried.

38,038. Are you on the Senate of the University?—No; but it was not the University that stood in the way. It was the Government who did not do it.

38,039. *Sir Ganga Ram*: By Government do you mean the Governor and his Minister or the Governor in Council?—The formula is "the Governor acting with his Ministers," and it is not for me, an outsider, to say whether it was the Minister, the Governor or anybody else that stood in the way.

38,040. *Mr. Kamat*: Supposing the Provinces receive assistance from the Central Government unconditionally, that is to say, without the least apprehension of interference, would you still be against that sort of system?—I cannot conceive of any Government giving away the taxpayer's money to another Government or to anybody else unconditionally. If I were a member of the Legislative Assembly, I should strongly object to the Central Government giving any money to a Provincial Government or to any other body without any condition or stipulation.

38,041. You realise that there should be a co-ordinating agency in the Central Government to co-ordinate research or some such work in all the different Provinces?—What do you mean by the word co-ordinating?

38,042. Either a body like the Board of Agriculture or a similar body specially constituted with a view to bring research matters into co-ordination in order to prevent overlapping?—If it is only to give advice to Local Governments after consideration by that central board I have not the slightest objection; on the other hand it may prove beneficial. But if it is to be something more than advice, if it is to be anything in the nature of control, I should certainly object.

38,043. You object to any co-ordinating agency at the Central Government in the form of an Agricultural Development Commissioner or Secretary, Central Advisory Board, or some such body coming into the Province and seeing on what lines your research work is being done, and then discussing and giving advice in such matters? But if it is mere advice you would not object, would you?—Provided the word advice is not a euphemism for control. May I say a word more with regard to that? I would invite the attention of this Commission, if I may, to the memorandum submitted by Sir John Hewett, a former Lieutenant-Governor of these Provinces, to the Royal Commission on Decentralisation. There he wrote from his own experience of the manner in which officers like the Inspector-General of Irrigation, the Inspector-General of Forests, the Director-General of the Indian Medical Service, although in theory they had no control over Local Governments, still reacted upon the Local Government's liberty of action, and I think he used language of bitterness which I have seen no agitator use.

38,044. Now about recruitment: are you in favour of provincialising all research? Research would doubtless require the best of experts and probably these experts would have to be recruited? Do you think that such recruitment should be done by the Local Government under the Lee Commission's recommendations?—By the phrase "provincialising research" I should not be understood to mean that I am opposed to the Government of India having a Central Research Institute with any number of officers according to their choice. Central Research institutions are even now a central subject and I cannot conceive of any Provincial Government having any objection whatsoever to any men being taken by the Government of India for that purpose; but officers for research purposes to be appointed in a Province and paid out of provincial revenues must be appointed by the Provincial Government and not by any other authority.

38,045. With regard to this question of recruitment, another witness, I think it was the Director of Agriculture, told the Commission that there is a dearth of experienced workers for the problems connected with plant breeding and crop improvement; that this is traceable in part to the long delay in deciding on what basis permanent recruitment to the higher posts should be made; and that the question is still unsettled and the rules delegating powers to the Local Government are being re-considered by the Secretary of State. As a publicist have you any idea as to what questions still remain to be settled and what are the rules with reference to the delegation of powers to the Local Government which the Secretary of State is reconsidering?—I cannot possibly tell you anything about that;

possibly somebody in the Government might be able to give you the information.

The press does not know? . . .

38,046. As an ex-Minister what idea have you formed about the Indians who are connected with research? Have they the capacity, the talents, and are they of the required calibre for such work?—Given the proper men there is no question of race. A competent Indian is as competent as a competent European.

38,047. And you think that the whole of the research work could eventually or should eventually be done by Indians in the Agricultural Service here?—Certainly.

38,048. How long do you think the department would have to depend upon foreign experts for research?—I should say until the date when the most junior officer now in service is due to retire.

38,049. As soon as that takes place you would Indianise the whole of the research department without any fear whatsoever?—I would Indianise it, no doubt, but I would put it in this way: I would leave the control entirely to the Local Government, who ought to have the power of bringing from abroad a person for any purpose for which one in this country is not available. I would not let the interests of the country suffer because an Indian was not available: if that were the case I would unhesitatingly go in for an outsider whoever he was.

38,050. Are the Indians who are interested in research work being given the fullest opportunity at the present moment in the Department?—I cannot say.

38,051. Irrigation, you say, should be a Transferred subject, and you have no fear that efficiency in that direction would suffer?—Not the slightest fear.

38,052. We have been told in one or two Provinces that the time has not yet come for Irrigation to be made a Transferred subject. You do not agree with that, do you?—From that point of view the time never will come.

38,053. *Mr. Calvert*: Is your view based on experience, or is it just a guess?—It is neither a guess nor is it based on experience; I should say that it is based on commonsense.

38,054. Just a vague guess?—No, I do not say it is a guess: I am much more confident than one making a guess would be. As things are at present in this Province we have a Chief Engineer in charge of Irrigation who is an Indian; then there was also not long ago an Indian Under-Secretary; and there are several Superintending Engineers in the Irrigation Branch who are Indians. I cannot imagine that, merely because the Member of the Government in charge of the subject is called a Minister and not a Member of the Executive Council, efficiency will suffer: I simply cannot conceive of such a thing.

38,055. *Mr. Kamat*: Would there be no fear that in the case of big irrigation projects the Legislative Council, for political reasons, would not countenance such schemes?—It is most unlikely, because, generally speaking, it was the Legislative Council and Indian public men who had to put pressure upon the Government to speed up irrigation works, and you, Sir, as a public man would doubtless vouch for that. As a matter of fact, it was only in connection with the Sukkur Barrage Scheme that there was an acute controversy between the Government and the Legislative Council owing, I believe, to a belief among a number of the Members of the Legislative Council, that the financial results would not be satisfactory. The most recent big irrigation work in these Provinces was the Sarda Canal Project, and the Legislative Council passed the scheme without the slightest

difficulty. Again assuming that the Legislative Council were inclined to create any difficulties, which could be done whether irrigation were a Transferred or a Reserved subject, in the latter case the Governor can exercise his power of certification, but I have not yet seen any Governor recklessly using his powers of certification.

38,056. With regard to your remarks in connection with local bodies, have you considered whether their difficulties about finances are not real?—Which local bodies?

38,057. District and Local Boards?—I have made no remarks about that.

38,058. You were asked a question a little while ago as to what was your opinion about the District and Local Boards, and you said that they were not quite satisfactory. Now, if they are not quite satisfactory, I ask you whether that is not partly due to the fact that they have not got sufficient funds?—Yes.

38,059. And most of the meagre funds at their disposal perhaps is allotted to communications, schools, etc., whereas agriculture is kept in the background?—The functions of the Municipal and District Boards are divided into two parts, obligatory and optional. There are certain things which the Board must provide for, and it is incumbent on them to spend money on such things, and there are certain other things, of which agriculture is one, on which it is optional for the Board to spend money, so that naturally according to the rules of the Boards so much money is not spent on agriculture as is spent on those subjects which are obligatory on the part of the Boards.

38,060. *Sir Henry Lawrence*: Is agriculture an optional function of the Board?—I think so.

38,061. *Mr. Kamat*: And so also are veterinary dispensaries?—I am afraid I could not tell you.

38,062. *Mr. Calvert*: I have just one question to ask you. When you were Minister was any attempt made to make provision for research into animal diseases?—I do not remember.

38,063. Were you, as Minister, responsible for the Bulandshahr School?—Yes.

38,064. *Professor Gangulee*: During the tenure of your office as Minister you organised what I think was known as the Provincial Development Board? Could you tell us what were the functions of that Board and how it worked?—To co-ordinate the activities of the various departments of the Government connected with economic development. Heads of Departments such as Agriculture, Irrigation, Public Works, Industries and Forests, were members of the Development Board. The Senior Member of the Board of Revenue was the Chairman of the Board. The Board met only twice while I was Minister, and since then it has not met. I speak subject to correction there, but I gathered the other day in the Legislative Council that the Board had ceased to function.

38,065. To what do you attribute that?—Lack of interest on the part of the Government.

38,066. And on the part of the heads of departments?—That means the Government.

38,067. Were there any non-officials on the Board?—Not a single one. It was intended to be a departmental body. The idea was that when the head of a department found himself confronted with a problem for the solution of which the assistance of another department was required he should bring it before the Board. Where problems required the co-operation of two or more departments they were to come before the Board, and the Board would evolve a programme which, after receiving the sanction of Government, would be binding on the departments concerned.

38,068. There was no representative of the Legislative Council on the Board?—No.

38,069. Have you any suggestions as to how such a body might be developed?—The intention was to secure full co-operation in common problems between, say, the Agricultural and Co-operative, Forests and Industries, or Industries and Agricultural departments.

38,070. It was to be a correlating agency?—Yes.

38,071. Its functions would be purely advisory?—Yes.

38,072. Would you be in favour of placing a special fund at the disposal of this body?—No funds were, in fact, at its disposal. Sir Harcourt Butler (the Governor who sanctioned the creation of this body) and myself were both of opinion that it was desirable to watch the progress of the Board during its initial stages carefully, and then decide what developments could be made. But first the Governor and then the Minister responsible disappeared, and then the Board itself disappeared also.

38,073. If you had another opportunity to constitute such a body, how would you set about it? In addition to the heads of departments, would you have some non-official members?—Probably, but I would not like to commit myself without giving further thought to the matter. In view of our experience with the last Board, however, I think a non-official element would be a safeguard for its continued existence.

38,074. During your tenure of office as Minister you felt the necessity for such a body to correlate the activities of the departments concerned?—Yes.

38,075. Do you know how things are progressing at the school at Bulandshahr since you left the Ministry?—I have heard conflicting accounts. I have heard non-officials express dissatisfaction, but the head of the department (in whom I have great confidence) has expressed a very favourable opinion. On the whole, I am inclined to think the results are favourable.

38,076. You have not been able to pay a visit to that school since you left the Ministry?—No. It has been no part of my functions.

38,077. What has happened with regard to this proposal you refer to in your note, to make the Agricultural College a University institution? I take it you wanted to affiliate the College to the University?—The intention was to make it an integral part of the University of Allahabad, which is a teaching and residential University. It still has an affiliating side, but that is soon to disappear. In the University Act, however, there is a provision that technical and agricultural institutions, although not situated within the limits of the city of Allahabad, may yet form part of the teaching and residential University of Allahabad, suitable arrangements being made. The committee to which I refer in my note made a recommendation in that sense which was accepted by Government, and a public announcement was made that steps would be taken to make the institution a part of the University. I do not know what happened after that, but no progress has been made.

38,078. You think it would be desirable for the Agricultural College to be given a University status?—Yes.

38,079. Were you connected with the Co-operative Department when you were Minister?—Yes.

38,080. That was one of your portfolios?—Yes.

38,081. What is the position of the co-operative movement in this Province?—So far as I am able to understand it, the position is that there is a large number of societies, but they are not well organised or strong. I

think in the initial stages there was a desire to multiply the number of societies rather than consolidate the position gained, with the result that there have been many liquidations and probably the societies have become more moneylending agencies than truly co-operative institutions. In the end Government set up a committee to inquire into the whole matter and make recommendations, and those recommendations are now under consideration by Government. One difficulty has been the lack of adequate non-official agency; there has not been a sufficient number of competent non-officials interested in the movement to give it strength, and so far as the department itself is concerned there has been more of the spirit of departmentalism than of co-operation.

38,082. Why are the non-officials in this Province not taking an interest in the movement?—They take some interest, but not enough. I hope their interest will grow.

38,083. Do you see any signs of it growing?—I hope it will. I cannot be more positive than that.

38,084. *Sir Henry Lawrence*: The Agricultural, Co-operative and Veterinary Departments were all under you when you were Minister?—Yes.

38,085. Do you consider you received sufficient revenue to spend on those departments?—In the first year there was no difficulty, the financial position of the Government being quite satisfactory. In the second year there was great difficulty, and in the third year even greater difficulty; we had to curtail our programmes very considerably for want of funds.

38,086. Can you tell me approximately how many lakhs were being spent on those subjects at that time?—I will not commit myself to any figures, but I think some figures are given by the Director of Agriculture in his memorandum.

38,087. The budget this year is nearly 30 lakhs; can you tell me how much it was before the Reforms came into force?—16 to 20, I think.

38,088. It has nearly doubled?—It includes non-recurring as well as recurring items.

38,089. Still, the expenditure from provincial revenue has nearly doubled?—But there has also been an increase in the resources open to the Local Government under the new system.

38,090. Can you tell us roughly what has been the increase in the resources of the Local Government during these six years?—I think Mr. Pim can tell you better than I can.

Mr. Pim: I cannot give the figures.

38,091. *Sir Henry Lawrence*: The budget last year was 13 crores. When you entered the Ministry it was about 7 crores; now it is 13?—That does not mean a net increase of 6 crores, because out of this the contribution to the Government of India has to be paid.

38,092. That contribution has been reduced?—Yes, during the last two years.

38,093. By how much?—By a little over a crore.

38,094. Taking those figures, out of an increase of six crores the increase in the amount spent on agriculture has been anything from 10 to 15 lakhs. In your opinion, is that a satisfactory allocation?—I do not think it is possible to give an absolute answer to that question. If there were to be a sudden increase of half a crore or a crore in the amount allotted, the department would not be able to spend it properly. I would rather the question were put in this form: "What is the amount the department is able to spend profitably and economically in a particular year? Would that

amount be available or not?" If the Finance Department can give to the Minister of Agriculture the amount he can profitably spend on agriculture, the position is satisfactory; otherwise it is not.

38,095. While your revenues under Government have increased from 7 to 13 crores, the expenditure on the department has increased from 16 to 30 lakhs; is that correct?—The increase is not net; many deductions have to be made from that 13 crores. There is the obligatory grant to the Famine Insurance Fund, the contribution to the Government of India, interest on debt and other things.

38,096. Have not these deductions been decreasing over this same period of six years?—Only the contribution to the Government of India; not the other items.

38,097. That decreased by 1¼ crores?—About that.

38,098. So that the net position of the Government has been very largely improved in these years?—The payments on account of interest have increased a great deal; the Government borrowed four crores of rupees in 1921 for the Sarda Canal and other works. They also spent out of that loan money on buildings costing over Rs.50,000; if a building costs Rs. 50,000 or more, it has been arranged that the money can be found from the development loan.

38,099. What I want to get from you is whether in your opinion agricultural interests have received sufficient attention. You speak of schemes having to be curtailed, but meantime the financial position of the Government was improving. Why should you have had difficulty in getting your schemes carried through?—The financial position of the Government was precarious in 1922, in spite of the increase in revenue.

38,100. You were satisfied you got all the money you could expect?—I was not satisfied; I do not think the head of any spending department is ever satisfied; but it would not be just to the Financial Department to say they were overflowing with money and refused to give it to us. There was financial difficulty in 1922 and 1923, leading to new taxation. If you want an answer to the general question of whether I think the Agricultural Department has, in all the circumstances of the case, received fair treatment, I should say, "Yes, tolerably fair treatment." It is quite possible it might have got more had there been retrenchment in certain other departments, but I should be sorry to commit myself to the proposition that it was unfairly treated; the Financial Department was anxious not to be unfair. Nor should I like to commit myself to the proposition that it was generously treated.

38,101. If we are to have a further development of agricultural research and demonstration, more money must be expended on these purposes. Have you any suggestions to make as to the directions in which this increased revenue should be sought?—The Local Government might obtain it by a gradual decrease of the expenditure in certain other departments, where I consider it is too high; but I would not hesitate to go in for new taxes if I found that, in spite of all adjustments, enough money was not available for development purposes.

38,102. Can you indicate where the new taxes should fall?—That would require detailed consideration. Moreover, as I have indicated in the first part of my memorandum, the whole basis of the financial relations between the Central and Provincial Governments requires reconsideration.

38,103. You are not prepared at the moment to suggest where additional taxation should fall?—No, nor am I prepared to recommend it at present, because I am not at all satisfied that the Governor in Council has effected all the economies which I believe to be possible.

38,104. Then I observe that your revenue now from excise is about 1½ crores?—Yes.

38,105. Do you contemplate the disappearance of that revenue?—Not the disappearance, but the reduction.

38,106. You are not an advocate of prohibition?—No.

38,107. Do you think that is a policy that is morally indefensible?—I do not care to commit myself to answer that question; I certainly think it it an utterly impracticable policy, and that is enough for me.

38,108. But you actually wish to see a reduction of that revenue?—Yes, but not for the sake of reducing the revenue, but in order to reduce the consumption.

38,109. Cannot you get a greater revenue with a decreased consumption? —That effort has been made as far as possible in this Province, and I do not think we can go further in that direction.

38,110. You were Minister for Excise, were you not?—Yes; the increase of duties was so heavy that I think any further increase would be very unwise.

38,111. Would it lead to illicit distillation?—There is illicit distillation even now, but it would increase considerably.

38,112. *Sir Ganga Ram*: When you were in charge of agriculture, do you think there was sufficient technical control over the expenditure incurred in that department?—Control by whom?

38,113. The other day in evidence it was stated before us that the estimates for tube wells were not checked by anyone because there was no one above the officer in charge having sufficient knowledge of technical matters. What precautions did you take to see that the money of the public was not wasted, and what control did you exercise over the officer in charge?—The controlling authority over him is the Director of Agriculture.

38,114. The Director of Agriculture denies having any technical knowledge on the subject?—He did not deny it to the Government.

38,115. He has said so before us?—I do not know what he said before you. The Agricultural Engineer never addressed the Government direct; he never can; whatever the Agricultural Engineer does is through the Director of Agriculture.

38,116. I particularly asked the Agricultural Engineer who checked his estimates; he said there was no one possessing sufficient technical knowledge to be able to check them. Is that so?—The Director of Agriculture is his superior; he has to approve what the Agricultural Engineer does.

38,117. I daresay he decides whether a tube well is required or not, but there is something beyond that. The zamindar who provides the money expects that his money will not be wasted?—The zamindar himself sees that his money is not wasted.

38,118. Why does he go to you?—For technical assistance, and he also gets an advance.

38,119. Who controls the technical part of it?—Besides the Director of Agriculture, there is no engineer above the Agricultural Engineer.

38,120. What steps did you take to see that the money of the zamindar was not wasted?—Whatever steps a lay member of the Government could take; that is all.

38,121. *The Chairman*: Is there no audit of these accounts?—There is an audit of all these things. In the beginning there was not; but at some point or other the last word must be left with some officer.

38,122. *Sir Ganga Ram*: The auditors cannot deal with the technical side. At least you should have asked the Agricultural Adviser to call for tenders, or, as a responsible Minister, you ought to have seen that the rates were correct by calling for tenders from other companies?—I daresay.

38,123. Is not that correct?—I do not know; I daresay; I take the idea from you.

38,124. And yet you want to convert Irrigation into a Transferred subject?—I should like to say that before Agriculture was a Transferred subject, precisely identical arrangements were in force under the Lieutenant Governor; it was not that when Transferred subjects were invented and Agriculture was included among Transferred subjects, the Minister of Agriculture came upon the scene to remove technical control or to do away with precautionary steps that had been in vogue.

38,125. But at that time the Lieutenant Governor had Secretaries who were technical men?—He had no technical Secretaries.

38,126. Not in agriculture, but he had in other departments?—The Secretary for Agriculture was an Officer of the Indian Civil Service who was Secretary for many other departments, and the self-same individual continued as the Secretary for Agriculture after I became Minister.

38,127. You recommend that Irrigation should become a Transferred subject?—Yes.

38,128. In that case, who would exercise control over the technical side of it?—Whoever is now exercising control when irrigation is a Reserved subject.

38,129. In that case would you revive the office of the Inspector General of Irrigation?—No.

38,130. Then who would do it? Formerly the Inspector General of Irrigation, who was a very senior officer, passed the technical part?—I am not entitled to put a question, but I should like to know who controls it now when irrigation is a Reserved subject.

38,131. At present there is a period of transition?—I say it will remain as at present; it will not be anything more unsatisfactory.

38,132. Moreover, may I point out that in many cases irrigation schemes concern more than one Province; the taking of water from natural sources sometimes affects two or three Provinces. As long as it is a Reserved subject, the supreme Irrigation Officer knows what projects come before him from various Provinces?—They would still know if it were a Transferred subject; there would be nothing to prevent them knowing.

38,133. For instance, supposing you sanctioned a scheme such as that of the Sarda Canal, and that scheme affected the Punjab as well as this Province, if it were a Transferred subject, you would sanction it without reference to the Punjab Government?—We cannot; the moment the Irrigation Officer is informed that the interests of another Province are also concerned, he will take steps to ascertain the position as it affects the other Province before making any decision.

38,134. *Mr. Kamat*: Is not the Public Works Department in charge of a lay Minister as a Transferred subject?—Yes.

38,135. Is there any technical control which he can exercise?—The Chief Engineer is the last authority.

38,136. *Sir Ganga Ram*: You say the staff of the Co-operative Department could have been replaced by Indians?—I did not say that with reference to the Co-operative Department, where the staff is Indian already.

38,137. You said that the staff could be got from outside?—I said from outside the ranks of revenue officers.

38,138. Did you mean without impairing the efficiency?—Even increasing the efficiency.

38,139. It will increase the efficiency?—It may. My proposition was this: at present the Government is tied down by rule to selection from the Revenue Department; I say they should not be so tied down; they should be at liberty to select the best available man whether he did or did not belong to a particular department.

38,140. You say you have little doubt that the Legislative Council will vote larger demands for grants if it is satisfied that the money will be wisely spent. What is the meaning of that? What precautions would you propose in order to satisfy them that the money is wisely spent?—Explanations given by the Department and the Government to the Legislative Council. I can illustrate my meaning by reference to one or two concrete cases. In 1920, it was decided by the Lieutenant Governor to purchase land near Meerut for 10 to 12 lakhs of rupees and to set up a cattle breeding farm; it was still a proposal; it had to go through the Legislative Council as part of the Budget of 1921. The Legislative Council was extremely unfriendly to the proposal, and it was postponed. The Director of Agriculture and I went to the spot, saw it, ascertained local opinion, and then the Director of Agriculture himself advised the Government not to go forward with that scheme, to drop it, and place the cattle breeding farms not under the Veterinary Department but under the Deputy Director of Agriculture in charge of cattle breeding. Now in that case if the Legislative Council had not been critical, 10 or 12 lakhs would have been spent upon the acquisition of that land, and more money might have been spent upon opening a cattle breeding farm there, whereas it was all found to be unnecessary and the Legislative Council was found to be quite right.

38,141. Are you aware that in order that your Province should be correctly described as protected from any chance of scarcity you want at least to protect 10,000,000 acres? Have you any idea how it could be done?—Mainly by wells.

38,142. At the rate of progress at which you have been constructing wells it would take 400 years?—Yes, but it is not necessarily tube wells everywhere.

38,143. Then what wells?—Ordinary wells.

38,144. You think there is scope for ordinary wells; are the zamindars capable of doing it?—I think so.

38,145. Without any help from Government?—Government does help.

38,146. But at this rate it would take 400 years?—Yes; we all advocate more speedy progress.

38,147. But how can Government help without any resources? You do not advocate any increased cess or taxes?—I am not opposed to it when the conditions present themselves for a new cess or a new tax. Suppose to-morrow a new tax or cess is imposed and a certain amount of money is realised, unless it is proposed to make a free gift of that money to the zamindars and tenants to make wells, then it will be necessary to secure the co-operation of the zamindars and tenants, who should spend part of their own money.

38,148. Have you canal schemes in view?—I have not; I have not been in charge of irrigation.

38,149. *Professor Gangulee*: The tube wells in this Province are sunk by Government subsidy?—Yes.

38,150. Do you approve of that system?—For the present I do, but I contemplate the time when there shall be no subsidy, but private individuals

shall do it with their own money. At present Government help is required to popularise the construction of tube wells.

38,151. *Sir Ganga Ram*: You said that the District Boards have duties some of which are obligatory and some optional. Is the making of communications obligatory?—Yes, to the extent of their resources.

38,152. If it is obligatory, then some scale must be laid down for all obligatory duties?—The only scale is the financial possibilities.

38,153. I understand that obligatory duties must be specified; that is to say, it must be specified what percentages of their funds must be spent on hospitals, education and communications. What is the rule in this Province?—The whole of the finances of the District Boards are spent on these objects.

38,154. But in what percentages?—It varies from district to district.

38,155. Have the communications improved since the Reforms?—I do not see any connection between the introduction of the Reforms and communications; if you are speaking of cause and effect, I see no connection; if you are referring to coincidence of time, they have not improved.

38,156. I ask your opinion as you have been observing the political trend; have the communications, which it is our duty on this Commission to consider, improved; have the District Boards spent a sufficiently large proportion of their grants on communications?—The District Boards are spending whatever they can; much more than they can spend is required.

38,157. *The Chairman*: There is no hypothecation of a particular percentage of revenue to a particular object?—No.

38,158. *Sir Ganga Ram*: You must, of course, recognise that whatever recommendations this Commission may make, it will involve additional expenditure, will it not?—I do not know; I recognise nothing; I do not know what the Commission will do.

38,159. What I want to ask you is, can you suggest any ways and means for the Government to carry out the recommendations of this Commission?—I do not know what those recommendations are. There have been recommendations of Commissions which we have done our best to frustrate.

38,160. I will put to you a concrete example. Supposing the salt tax were doubled, would you support it?—No, I would not. I should like to add that the salt tax, whether it is doubled or trebled, will not come to the Provincial Governments, and unless this Commission is going to recommend that agriculture should be a central subject under the Government of India I do not see what connection there is between the salt tax and the recommendations of this Commission.

38,161. *Sir Thomas Middleton*: You informed us that when you were Minister you made an attempt to affiliate the Agricultural College to the University of Allahabad. Can you tell me whether that would have involved any considerable change in the curriculum of the College?—No, not necessarily.

38,162. May we take it that the addition to the cost would not have been great?—I do not think there would have been any addition to the cost at all on account of the affiliation. Affiliation by itself would not have involved any cost. If, on the other hand, after affiliation, the course was stiffened or extended, or the University insisted upon better laboratories, better equipment, and if there would have been an increase in the cost, it would have been met

38,163. Was there any fear that there might have been a considerable increase in cost? Was that question discussed?—I do not think so. I think it is rather the opposition of the department to come under the control of the University which has stood in the way.

38,164. You have told us that you look forward to a time when the personnel of the Agricultural Department shall be completely Indian?—I say it should be completely recruited by the Local Government.

38,165. I judged from your answer to Mr. Kamat that your view was that the staff should be largely or entirely Indian born?—Yes, to the largest extent possible compatible with efficiency.

38,166. Now, granting that Indians will have naturally just as good qualifications for research work in agriculture as the British or the Americans or French or Germans, would you agree with me that the experience of all these countries has shown that in order to train up useful workers a long and extensive training is required?—Yes, I agree.

38,167. The point I was coming to is this. Each of your Indian Provinces requires a number of specialist workers. But the number in each Province is quite small, two to three workers on a particular subject. For example, at the present time you are thinking of getting an Economic Botanist, and you might want two or three Economic Botanists in this Province. Vacancies will arise at rather long intervals, therefore your individual need for Economic Botanists will not be large. But if you were to pool all the requirements of the Indian Provinces for men of that class, the demand would be substantially larger and would be fairly steady and a scheme for training would be a much easier matter for India as a whole than it would be for any individual Province. Now, do you think that there should be co-operation between the Indian Provinces for the purpose of training men?—I have no objection to that.

38,168. Would you even go so far as to co-operate with the Government of India?—I would co-operate on equal terms always, but not on the principle of subordinate partnership.

38,169. If you could see a scheme for training men made applicable to the whole country you agree that it would be desirable and that all Provinces might well co-operate in it?—I should consider such a proposal on the merits without any prejudice whatever.

38,170. *Raja Sir Rampal Singh*: Before you were Minister were these demonstration farms, &c., controlled by the Government, running at a loss?—Yes, they were.

38,171. Did the Legislative Council in those days raise objections?—It did.

38,172. Did you take steps to economise the expenditure?—Yes.

38,173. And now they are running at a profit?—Yes, so I am told.

38,174. *Mr. Kamat*: With reference to the co-operative movement in your Province, in answer to one of the questions you said that the non-official element here did not take sufficient part?—I said there was not a sufficient number of non-official workers.

38,175. To what do you attribute that? Is it due to the system of landlords and tenants or is it due to any backwardness of general education and lack of public spirit?—It is due to general backwardness. Public spirit is less widely diffused than in Bombay. I should also lay a part of the responsibility at the door of the department. The Co-operative Department has been running like any other bureaucratised department and not with a spirit of enthusiasm and missionary faith.

38,176. Do you mean to say that the Co-operative Department is running more or less mechanically like a wooden department, without much zeal for the welfare of the people?—I do not say that it does not care for the welfare of the people. It has got its Registrar, Deputy Registrar, Assistant Registrars and so on, just like Tahsildars and others; it is all departmentalism.

38,177. *Professor Gangulee*: Do you think that public opinion in this country is ripe for compulsory primary education?—Yes, it is ripe.

38,178. Do you think there is demand for it?—It is not active; but it is one of those things where the supply creates the demand.

38,179. Do you think the District Boards are adequately interested in compulsory primary education?—They are interested, but they are financially very weak. An Act has been passed, but none of them has yet enforced it.

38,180. Do you think the educated people of this Province are willing to tax themselves for attaining this end?—Yes; but they must first be satisfied that every rupee of the money now collected in taxes is put to profitable use and that there is no extravagance or unnecessary expenditure.

38,181. *Sir Ganga Ram*: You say in your note that competent men should be appointed as Ministers. You know the principle on which the Ministers are appointed is that they should have a sufficient following; it is the democratic principle?—Yes; that is all on paper. I think Ministers have been appointed, at least in some cases, merely according to the personal whims of the Governor.

38,182. I hope that was not the case with you?—It was so in my case. It was not that I was appointed Minister after the Governor had ascertained what following I had in the Council. He wanted to appoint me, and he appointed me.

38,183. *The Chairman*: Is it your view that one effect of the Reforms has been to quicken public interest in agriculture?—Yes.

38,184. Do you think discussions on agricultural subjects in the legislature have helped to attract public interest?—Yes; the Legislative Council is keenly interested in them.

(The witness withdrew.)

Messrs. A. B. SHAKESPEAR, C.I.E., J. G. RYAN, NOEL DEERR, representing Indian Producers' Association, Cawnpore.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) The Indian Sugar Producers' Association is of opinion that research into agriculture generally should be an Imperial matter and that this should be under the control of one centralised body. If, however, this control be located at Pusa, it will be necessary greatly to augment the staff. The policy under which the work is carried on should be directed by the Imperial Government working through a Central Advisory Board of Agriculture associated with the Member-in-Charge, and as regards the results of research, this body would work with the Departments of Agriculture of the several Provinces.

It should not be left to the Provincial Governments to decide what work is to be attempted. The Imperial Government would, of course, remain in touch with the Provincial Governments, but if each Province has its own research organisation, there is danger of much overlapping and duplication which will be avoided with one centralised authority. The Association is of opinion that research into agriculture should study the traditional methods pursued by the Indian cultivator and build up its improvements upon these traditions, as it is obvious that the 3,000 years' accumulated experience of the Indian agriculturist must contain elements of value which should not be overlooked by the Western expert.

(*c*) In the industry which the Association represents it advocates an extension of research into:—

(1) The various diseases of fungid origin to which the sugar cane is subject, and

(2) The insect pests which attack the sugar cane.

Under (1) should be included the breeding of canes immune or resistant to disease and under (2) the study of the prospects of introducing the "natural method" of plant pest control.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) As regards the Provinces of Bihar and Orissa, and to a less degree the United Provinces of Agra and Oudh, the Association is of opinion that more institutions and instructors are needed. Reference is not made to such costly institutions as the Agricultural College at Cawnpore, as this can only appeal to a very limited number and cannot reach the great majority of the small cultivators. It is believed that a certain amount of decentralisation would be more effective, and that the establishment of a greater number of demonstration farms would have a much greater influence. The officials in charge of such farms should be individuals who have both sympathy and influence with the small cultivator.

The Association advocates the establishment of one centralised sugar school to operate for the whole of India, at which Indians may be taught the principles underlying sugar manufacture. The school should form a post-graduate course and should only be open to students who have already taken the B.Sc. Degree.

(ii) The Association recommends an increase in the number of trained field instructors who will be in close contact and sympathy with the small cultivator. The Association is also of opinion that an extension of agricultural service is possible by cinema propaganda and by the distribution of leaflets in the vernacular written in very simple language.

In the sugar industry attention is called to the necessity of impressing on the cultivator the benefits he will derive from planting cane from selected disease-free seed, and this is one of many points where, in this particular industry, benefit would follow from an increase in the number of trained field instructors who will come into close contact with the cultivator.

(iii) Not necessarily, but the syllabus of primary education should, in agricultural areas, include elementary agricultural instruction.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*), (*b*) and (*c*) The experience of the Association as regards the sugar industry in Bihar and Orissa and in the United Provinces has been that the ryot is inherently conservative and is slow to adopt any development outside of his traditional routine. The Association is also of opinion that close personal contact with individuals who enjoy his confidence will be effective in persuading the ryot to depart from tradition, and any individuals who are charged with this duty should be familiar with the ryots' psychology and mental processes.

The necessity of intimate association with and mothering of the ryot is shown in the following actual conversation:—

Q. Do you know Government has provided better varieties of cane than that which you are now growing?

A. Yes, I have been told so.

Q. Why do you not get them?

A. The Government farm is many miles away. I cannot go there.

Q. If the canes were given you, would you grow them?

A. Yes, if Government were to send some one with these new canes, I would plant them.

A further suggestion would be to operate through the headman of a village or group of villages carrying out demonstrations on land leased for short periods from the actual cultivator, and a demonstration of this nature

may possibly appeal to the ryot more intensively than a demonstration on a Government farm.

(*d*) The Association wishes to instance in particular the success in extending cultivation by ryots and the adoption of new varieties of sugar cane by the ryots which has already taken place at the Dowlatpore Agricultural Concern, in the district of Darbhanga, under the management of Mr. C. Atkins.

QUESTION 4.—ADMINISTRATION.—(*c*) (ii) and (iii) This subject is dealt with in the reply to Question 20, marketing.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—The Association advocates the extension of the Co-operative Banking system and the enlargement of the existing powers of such banks.

All possible means should be used to free the ryot from the bondage of the village moneylender and full use should be made of the Usurious Loans Act.

The Association suggests that consideration should be given to the introduction of legislation aimed at limiting the right to mortgage immovable property, except to recognised banks and credit institutions.

QUESTION 8.—IRRIGATION.—(*a*) The Association would draw attention to the districts of Champaran, Muzaffarpur and Darbhanga in North Bihar, where it believes that the Chota Gundak, the Bagmati and other small rivers could be utilised, and if so that the production of the areas which could be commanded from these sources of water could be much increased.

In the areas mentioned above there exists a series of lakes formed by the old bed of the Chota Gundak, all of which might be used as reservoirs for water and, in addition, it appears likely that by the construction of dams in this area, further supplies of water might be stored and distributed during the dry season before the break of the monsoon.

The obstacles which exist to the extension of irrigation in the above mentioned areas are:—

(1) Prejudice. It has been generally held that the use of irrigation will lower the fertility of the soil and reduce its water holding properties and at the same time induce the rise of injurious alkali. While the last mentioned might happen with only occasional irrigations, the Association does not anticipate harm from this cause with systematic irrigation.

(2) Small holdings and the difficulty of other than riparian holders obtaining access to the sources of water.

(3) Except in isolated cases, the individual holder of land has not the means to command even the very moderate capital required.

It may be added that the Association believes that crops in general and the sugar cane crop in particular would be very materially increased in this area if water could be supplied during the period March 1st-June 15th, the date at which the monsoon is expected to break in this area.

QUESTION 10.—FERTILISERS.—(*a*) Yes. In the districts with which the Association is most familiar in Bihar and Orissa and the United Provinces of Agra and Oudh, the use of artificial fertilisers is nearly non-existent and the practice of pasturing livestock by allowing them to roam over the country side results in the loss of all the urine and most of the solid excreta. In villages of any size, we are inclined to believe that a community scheme for the conservation of night soil and refuse, combined with the "Adco" process of nitrogen fixation, would have a reasonable prospect of success. The ryot is unfamiliar with the use of artificial manures, and to pursuade him to embark on their use, demonstrations of their benefit would have to be made in such a way that the benefit to be obtained would be patently visible to him. A danger to the successful use of artificial

manures would be that the ryot might easily be led to suppose that their application was the be all and end all of cultivation, whereas, the better the cultivation the more pronounced will be the advantage to be gained from their use.

(*b*) The application of an act similar to the Food and Drugs Act to the sale of fertilisers with exemplary penalties for fraudulent adulteration.

(*c*) Demonstration on lands belonging to cultivators, the demonstration being made at many localities and arranged in such a way that the results are directly apparent to the cultivators.

(*d*) On the sugar properties operated in Bihar by Messrs. Begg, Sutherland & Co., Ltd., and by the Japahat Sugar Company.

(*f*) The establishment by Government of depots at which coal could be purchased at reasonable rates and the further exploration of the possibilities of introducing an oil stove to take the place of the present open hearth.

The Association is in entire agreement with the evidence recently given before the Commission by Mr. C. M. Hutchinson,* lately of the Imperial Research Institute, Pusa.

QUESTION 11.—CROPS.—(*a*) The Association advocates the extension of the work already in progress in breeding new varieties of grain crops, sugarcane, &c. As regards sugarcane, the Association believes that the work already done has been and continues to be of great value to the community. While the ryot has been somewhat slow to make use of this development in the case of sugarcane, he is in Bihar and Orissa and in the United Provinces now beginning to show interest, and the Association anticipates a great extension of the new varieties of sugarcane produced at Coimbatore.

QUESTION 12.—CULTIVATION.—(i) Yes, by the adoption of deeper ploughing; but this involves the necessity for improving draught cattle to haul the more powerful ploughs which would then be essential. It also connotes the desirable extension of the use of power tractors in the case of large holdings.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(*i*) The Association advocates a system of plant quarantine and the prohibition of the importation of plants of any nature, except through the agency of a department which should be under Imperial control. This would necessitate the establishment of a quarantine station (or stations) where imported plants would first be grown under strict control and not issued until a clean bill of health be assured.

(ii) The Association advocates a system of internal quarantine, and where the existence of a pest or disease is known in any area, the export of seed from that area should be prohibited. It suggests the organisation of a body of travelling crop inspectors in this connection.

QUESTION 20.—MARKETING.—(*b*) No. As regards the marketing of *gur*, the Association is of opinion that the grower of the cane is the individual who receives the least benefit. It is believed that his legitimate profits are largely absorbed by village moneylenders, in transport, and by middlemen and brokers. As a possible means of reform, the co-operative marketing of *gur* by villagers or groups of villagers under Government direction at the outset might be considered.

As regards the marketing of sugarcane, that is to say, its purchase by central factories, the Association advocates that every facility be given to the laying down of privately owned tramways.

At the present time there is direct evidence to show that District Boards, so far from affording these facilities, place almost insuperable difficulties in the way of the construction and development of private tramways. The Association desires to record the instance of the District Board of Durbhanga

* Vide Bengal Volume of Evidence.

in dealing with the enterprise of the Ryam and Lohat Sugar Companies in laying down light lines at their own cost along the road sides to serve their factories.

Not only were these companies compelled to agree to pay a royalty of one anna per ton on all cane carried over the tramways they constructed, but they were further compelled to undertake the whole cost of the up-keep, not merely of their lines, but of the cart and carriage road alongside which they ran. Representations that the tram lines actually saved the roads from damage by the heavy cane traffic, which would otherwise be carried in ordinary bullock carts on these roads, were entirely set aside, and the factories and ryots alike were penalised by this unfair charge for road maintenance, which naturally increased the cost of transport on the one hand and reduced the price of the cane payable to the ryot on the other.

The general improvement of the roads in practically all sugar-growing districts is urgently called for. The present condition of the existing roads precludes any consideration of mechanical transport, while the entire want of suitable roads in many districts prevents the establishment of factories for dealing with sugarcane.

QUESTION 21.—TARIFFS.—In the case of the sugar industry the reply is not only in the negative, but it is necessary to emphasise that the present import tariff on sugar is of benefit to the cultivator of sugarcane.

The Association views with considerable apprehension the implied recommendation of the Indian Taxation Enquiry Committee, as contained in paragraph 145 of their Report, that the present import duty on sugar should be reduced.

If this is given effect to, an immediate check will be given to the development now proceeding in the sugar industry, and it is highly probable that the cultivation of sugar in India, the importance of which has been recognised by Government, will be endangered.

Oral Evidence.

38,185. *The Chairman*: Mr. Shakespear, you are Chairman of the Association of Indian Sugar Producers. Mr. Noel Deerr, you are Sugar Technologist, and Mr. Ryan, you are the Secretary of the Association?—(*Mr. Shakespear*): Yes.

38,186. I think it is to you, Mr. Ryan, we are indebted for the note of evidence upon which you gentlemen have to be heard?—(*Mr. Ryan*): To my committee. (*Mr. Shakespear*): There is one matter outside the written evidence which I would like to say a few words about. I would like to make mention of the Report of the Indian Sugar Committee. The Committee was constituted in 1920, and I would like to say that it has been a great disappointment to the sugar industry that Government has done so very little, in fact, scarcely anything at all, to further the measures that that Committee advocated. We realise, of course, that changes have come over the position since the Committee issued its Report, and I would hesitate to say that everything which the Committee then recommended would now be applicable. But along certain lines the industry has proved that the recommendations of the Committee were well founded, and I would ask this Commission to urge Government to take immediate action in certain directions and devote the necessary funds. We particularly refer to the strengthening of the technical staff at the Pusa Institute by the recruitment of special officers for work on the agricultural side of the industry, such as the study of soils, cane diseases, insect pests and cultivation methods generally, combined with an enlargement in the staff of trained fieldmen and instructors, the establishment of more seed farms, demonstration farms and, what we consider most important, the provision of at least one high altitude nursery for the preservation of new types of cane. With regard to the other

measures suggested by the Committee, some of which I realise involve the setting up of costly and complex machinery, I would recommend that Government be asked to constitute a small committee as soon as possible to which our Association would be able to send a representative, to examine the Sugar Committee's Report and advise as to what modifications should now be made in its recommendations to meet present-day conditions. For carrying out of the Sugar Committee's complete programme a very large sum of money would necessarily be required, and our Association would suggest that to provide the necessary funds a small portion of the revenue now being realised from the import duty on sugar might be set apart for this purpose.

38,187. Are there any particular points in the recommendations of the Indian Sugar Committee which you were thinking of when you said that there were certain recommendations which might not necessarily be applicable or advisable now?—One important point is the Committee's recommendation for the establishment of a large demonstration factory which was to undertake the manufacture of sugar on a commercial scale; that is a very expensive project which would cost, I estimate, about 20 lakhs of rupees, and with the advance that we have made towards efficiency, we do not now consider that it would be necessary to establish such a factory, there being factories in India working on modern lines where any new processes could be carried out under the direction of Government. I think if the Committee's report were to be again examined, it would be found that opinion would be against that particular recommendation.

38,188. In that connection, have you any other important recommendations to mention?—I am not fully satisfied that the establishment of a Sugar Board would be necessary. This was a recommendation made by the Sugar Committee.

38,189. The existing Sugar Bureau was intended to be the germ of the Indian Sugar Board, was it not?—The Board was intended to be a central body for purposes of general control. I think we would secure what is necessary for the industry in the present organisation, if the technical staff at the Pusa Institute was enlarged, as I have recommended.

38,190. You wish the Bureau to be put on a permanent footing and the technical staff to be enlarged?—Yes.

38,191. I think there was a proposal at one time according to which, by means of a cess, the industry itself would assist in financing the Indian Sugar Board or might have assisted in defraying the expenses of the Sugar Bureau? Have you anything to say on that?—We did come forward with that proposal at a time when we thought that Government was not only not going to do anything for us, but was going to take away what had been done, so that we thought it was our duty to come forward and ask that we should be taxed in case Government could not provide the funds or were unable in any way to maintain the work which was being then carried on.

38,192. And why did that proposal break down?—We were led to believe that the matter would be reconsidered and that Government would be in a position to find the necessary funds; also the industry fell on rather evil days, and our members were not then by any means unanimous in wishing to submit to taxation.

38,193. That was one of the principal difficulties, was it not?—Yes, we found that dissensions had crept in.

38,194. Have you anything to say about the cable service?—The present cable service for sugar information is quite satisfactory.

38,195. And this, you think, ought also to be made a permanent organisation?—Yes.

38,196. I think we have all the information that we require as to the constitution and history of the Indian Sugar Producers' Association?—We represent about 90 per cent. of factory-made sugar interests in India.

38,197. Has your membership been rising or falling?—It has been rising.

38,198. Turning to the note which has been put in by the Committee of the Indian Sugar Producers' Association, I notice that the general trend of the views there expressed is towards the centralisation of research under the Government of India. How do you gentlemen think that any proposal of that sort would work in with the existing facts of the Reforms and of the Provincialisation of agriculture as a subject?—We feel that sugar research work is such a highly technical subject that it should be kept under the control of a central body. It would be really following what has been done so successfully in the island of Java, where work of that nature is not decentralized. The officers of the central organization tour about and obtain opinions, but research and policy are entirely centralized in the hands of one body, and I think we rather feel, at the present stage of our knowledge of the agricultural officers in India, that it might be dangerous if the control of the policy as regards sugar cultivation were to pass into the hands of the Provinces.

38,199. You mentioned a little while ago that you did not now regard the setting up of an experimental factory as necessary or even advisable. Does that mean to give the impression that, on the technical side, you do not wish Government to make any further investigation?—I did not mean that, but I merely wished it to be understood that we have factories established in which the working out of any special processes or systems of manufacture could be conducted without Government having to incur the expense of setting up a costly institution of that kind.

38,200. But you do think that there is need for further research in the technical sphere?—Yes, we hope to go further ahead.

38,201. It is mainly in the botanical and the agricultural fields that you say Government should work?—I think that is the greatest need of the industry at present, except, of course, with regard to the manufacture of the raw sugar of the country.

38,202. What representation, if any, has the grower on your association?—There is no direct representation; they have associations of their own and we work through them. There is an Association of Planters in Bihar, and there are two supplementary associations representing districts in which European growers are working.

38,203. Do you think it possible for your Association to get into closer touch with the grower? It would strengthen your position before the public a great deal, would it not?—Yes; it certainly would, and our Association is open to membership.

38,204. How much would it cost a cultivator to become a member of the Association?—We have got a uniform subscription.

38,205. Do you think that is fair, as between the zamindar and the factory, that he should pay the same subscription?—I do not think it is fair; but it would all depend on the position of the zamindar himself, for he might have very large landed property.

38,206. So that it does not look as though particular pains have been taken to attract the cultivator into the organization?

38,207. Your note deals, on page 498, with the question of marketing, and you start off there by saying that the association is of opinion that "the grower of the cane is the individual who receives the least benefit. It is believed that his legitimate profits are largely absorbed by village moneylenders, in transport, and by middlemen and brokers"?—That is what we are trying to overcome by attracting more cane direct to the factories.

38,208. Would not some representation of the growers on your association and the concentration of a little more attention on the actual problems of marketing by your association both help the cultivator and, in the long run, be in the interest of your manufacturing members?—The members of the association themselves seek to overcome that by attracting sugar cane direct to the factories where the man is paid cash and he gets 100 per cent. of the value of his crop, excluding the cartage. If his cane is manufactured into raw sugar, it has to pass through various channels, and, of course, there is a large proportion absorbed by brokerage and other deductions.

38,209. The notion of organizing the industry from the grower through the distributors to the point of final manufacture and sale is one which is being developed all over the world in many crops, is it not?—We do conform where we can induce the grower to sell his cane. We have made great strides in that direction.

38,210. I am trying to get from you whether you think more might be done by your Association, by propaganda?—I see the point. But, of course, in many cases one has to deal with multitudes of small growers and difficulties present themselves.

I do not suggest they should all be members of your Association, much less of your committee; but if there was one man who could represent their interests on your committee, it might be helpful.

38,211. Do you wish to say anything about the work of the Cane Section at Coimbatore, other than what you have told us in the various memoranda you have provided?—We think it has been admirable. Dr. Barber's retirement was a great loss to India; if he had been able to remain a few more years more valuable work would have been done, but he laid the foundation of the work which has proved so beneficial.

38,212. Have you any members in Madras?—Yes.

38,213. Do they ever complain that the efforts of Coimbatore have been directed to the improvement of cane for Northern India rather than for Madras?—Yes, there was a suggestion at one time they did not receive sufficient attention.

38,214. On page 497, in answer to our question on irrigation, you draw attention to the possibility of irrigating certain areas in North Bihar (Champaran, Muzaffarpur and Darbhanga). Are there suggestions made as a result of technical advice your Association has received from competent engineers?—They are the result of actual work carried out in certain instances.

38,215. The language used suggests that these are projects which have been examined?—They have not been examined by Government.

38,216. Does the utilisation of the water from the series of lakes formed by the old bed of the Chota Gundak involve a lift scheme?—Yes.

38,217. Is the area which would be commanded by such a scheme cultivated by large zamindars?—(*Mr. Noel Deerr*): No, they are nearly all small landowners.

38,218. Have you contemplated bringing them into some combination to finance a scheme of lift irrigation?—No, because the scheme is so big that it would have to be carried out with the consent and approval of Government.

38,219. Do you suggest Government should undertake the first charge, construct the pumping station and sell the water to the cultivators?—That would be one way of doing it, but the system of land tenure and the difficulty of getting rights of way and access to the water would be so great that it would have to be carried out as a Government undertaking.

38,220. Government would stand to the cultivator in this lift irrigation scheme in the same way as in the case of canal-carried water?—(*Mr. Shakespear*): Yes.

38,221. You suggest it is a general impression that irrigation will lower the fertility of the soil? On whose part is this prejudice against irrigation?—(*Mr. Noel Deerr*): That is the opinion of many European planters in Bihar.

38,222. What is the origin of that mysterious belief?—The Bihar soils contain a certain amount of alkali. If you irrigate once and then stop you will bring that alkali to the surface; but if you go on irrigating systematically, and combine your irrigation with drainage, you will wash out the alkali and leave the land better than before. One irrigation may do harm, but systematic irrigation is successful.

38,223. On page 498 you tell us something about the difficulties experienced in the construction of light railways. Are those paragraphs founded on one or two instances, or on many more?—(*Mr. Shakespear*): On instances known to us where we have suffered from these experiences.

38,224. I recollect that Mr. J. A. Henry, who appeared before the Commission at Pusa, gave some evidence on this question. I think he wanted to lay a light tramway for the cane season only on District Board roads, but the Boards would only agree on condition that a royalty was paid?—Yes, obstruction was put in the way.

38,225. Why are District Boards hostile to schemes of this sort?—I think they have not been educated to understand the development which will follow tramways.

38,226. Would your Association suggest that local authorities should allow your members to lay light railways by the side of the road without paying any rent or royalty at all?—We would have to pay something. I think villages do not like a tramway close to them.

38,227. Why not?—In nearly all cases you have to go past, and in some cases through, certain villages. I cannot tell you why they dislike it; I suppose it is because it has a disturbing influence.

38,228. *Professor Gangulee*: They like the motor-omnibuses?—Yes, but they can ride on them.

38,229. *The Chairman*: Have you gentlemen thoroughly considered the recommendation to appoint another committee to review the recommendations of the Indian Sugar Committee? It will mean more delay. Would it not be possible to make definite recommendations as to the parts of that Committee's Report which no longer apply?—(*Mr. Shakespear*): We have not at this stage examined the recommendations exhaustively, but what we urge is that in certain well-defined directions, such as the recruitment of a special staff for work on sugar, no delay should be allowed to occur.

38,230. And the placing on a permanent footing of the Sugar Bureau?—Yes.

38,231. If that were done, do you not think the Bureau, in consultation with the trade and with growers, and from its knowledge of the industry as a whole, would be able to judge which of these recommendations (provided money were available) should be given effect to and which should be dropped?—I think so.

38,232. I am only suggesting to you that the appointment of another committee means further delay?—I see that. Delay is the last thing we want.

38,233. *Sir James MacKenna:* You have considerable experience of sugar, Mr. Deerr. Can you make any estimate of the economic loss due to the

present deficient methods of cultivation and manufacture of sugarcane?-(*Mr. Noel Deerr*): Yes. I estimate the area as 2¾ million acres, and the return at present at 10 tons of cane per acre. With the ordinary two-roller bullock mill the out-turn will be 2¾ million tons, so that at Rs. 140 a ton the total value will be Rs. 38½ crores. If that quantity of sugarcane were treated in a modern factory, there would be produced a quantity of sugar and molasses which, taking the price of the sugar at Rs. 330 and of the molasses at Rs. 55, would give a total value of Rs. 86 crores, as compared with Rs. 38½ crores. That means there would be a net gain of Rs. 50 crores.

38,234. Have you worked out what acreage would meet Indian local consumption if improved manufacturing processes were introduced?—Yes. I will look that up and let you know later.

38,235. What are the views of your Association about the zone system? You will remember the matter was raised in the Sugar Committee?—(*Mr Shakespear*): Yes. Mr. Wynne Sayer submitted a special memorandum dealing with it. Our Association would welcome measures being taken which would ensure to a central factory a certain area of cane cultivated. That system obtains in Java, where certain zones are allotted, and where no factory is allowed to encroach on the zone of another. That was prescribed when they laid the foundations of their sugar industry. The problem to-day in India is very different; rights have been acquired, and although we support the principle, personally I cannot see how it can be translated into a legislative act. I understand it obtains in the United Kingdom with regard to beetroot factories, but there Government has a weapon which we have not got in this country. There is no doubt that the present system is most injurious; the new-comer, instead of paying particular attention to developing the cultivation in his vicinity, if it does not happen to be there when he sets up his factory, thinks it the easiest way is to proceed to pirate somebody else's cultivation. That cultivation does not in a sense belong to the other factory, but the other factory has acquired a right of control by long usage. We have had experience of this procedure; it leads to three or four and, in some cases, I think five different concerns all buying sugarcane at one railway station; that is uneconomical; the cane is hauled long distances and it is naturally not so valuable to the outside factories when they get it as it would be if it were grown near at hand. It also has another bad feature in that it discourages factories from developing and taking measures to encourage cultivation in their own neighbourhood where they realise that this cane can be drawn away by somebody else. The problem is a very complex one; we support the proposal in principle, but I foresee difficulties in putting it into actual practice, and exactly how Government could proceed in such a matter if they thought it advisable to do so I do not think any of us are prepared to say. We would like to see the system introduced if it could be. Of course, it would not be applied in the case of established concerns, only in the case of concerns now starting.

38,236. *Sir Henry Lawrence*: The Government weapon in the United Kingdom is a subsidy, is it?—Yes, I understand so.

38,237. That is what you had in mind?—Yes.

38,238. *Professor Gangulee*: That is only with regard to beet sugar I think?—Yes, that is the only raw material that is grown in the United Kingdom.

38,239. *Sir James MacKenna*: Have you got that figure now?—(*Mr. Noel Deerr*): Yes, under modern methods of cultivation and manufacture, instead of 2,750,000 acres under cane, all India's need of sugar could be produced by 1,583,333 acres, which would allow 1,166,667 acres to be set free for other crops.

38,240. Are you satisfied with the existing machinery for the dissemination of the improved varieties of cane?—(*Mr. Shakespear*): There is not enough machinery, of course, but the system is right. We want many more workers, more trained men and more instructors.

38,241. Is the Association giving any help in the distribution of these varieties?—Our members are.

38,242. From the estates?—The Association as an association is not, but our members are; we are raising seed and distributing it to cultivators.

38,243. Did you see any concentrated increase of particular varieties in particular localities?—In Bihar, yes. I do not know how many acres there are under the new canes. (*Mr. Noel Deerr*): Last year there were 3,052 acres in Bihar under Coimbatore canes. That is only the canes which came to Begg Sutherland's factories.

38,244. *Professor Gangulee*: That is only in Bihar?—Yes.

38,245. Can you tell us with regard to the United Provinces?—We have no figures for the United Provinces.

38,246. *Sir James MacKenna*: But I understand there is a very big produce from Shahjahanpur; would you deal with that cane in any of your factories?—(*Mr. Shakespear*): We do not think there is a large distribution of Coimbatore cane from Shahjahanpur. I believe there is of other cane, which we do not cultivate.

38,247. What factories deal with those canes? Does Rosa?—Yes, Rosa does.

38,248. What steps have the Association been taking to improve manufacturing operations?—I think all our members are taking steps to raise the efficiency of their factories.

38,249. Has the improvement in manufacturing processes been very marked in recent years?—Yes, very marked in the last three years.

38,250. Under the stimulus of high prices, or what?—No, we knew the high prices were not going to last, so we set about putting our house in order.

38,251. Can you give us any definite figures of the yield of these Coimbatore canes which you grow on your own estates, showing their superiority over the *deshi* varieties?—(*Mr. Noel Deerr*): Yes, in the factories operated by Messrs. Begg, Sutherland & Company the returns in tons per acre (that is short tons of 2,000 lbs.) were, of the Coimbatore varieties in the season 1925-26 an average of 22·9 tons per acre as compared with 9·8 tons per acre of the local variety. Over the whole of the acreage returns collected by Begg, Sutherland & Company, that is to say, the canes we buy, the average of the Coimbatore varieties was 15·5 tons per acre as compared with 7·6 tons of the local varieties. We do not get the figures for the other concerns which are not in our group.

38,252. For the more rapid development of the sugar industry as a whole and of cane growing in particular, are you in favour of the co-ordination of work between the Imperial Department and the Provincial Departments, or have you any ideas as to how such co-ordination could be effected. I think you said in Bihar you look to Pusa more than to the Provincial Government?—(*Mr. Shakespear*): Co-ordination must follow, but in the initial stages we should not like to see research work provincialised; we think research and attention to disease and insect pests should be centralised with the Government of India. Once the canes have been established, proved and distributed for general cultivation, then I think it is the duty of the Provincial Governments to step in and carry out the rest of the work, the popularisation of the new types and so on.

38,253. Of course, in this Province you have a concrete instance where very well-known work is being done on sugarcane provincially?—Yes, I know Mr. Clarke's work, but there you have got an enthusiastic officer; in all cases you may not have enthusiastic officers and you may have cleavage of opinion between a provincial Director and the central organisation over some matter which is highly technical.

38,254. In answer to the Chairman you have already expressed the view that the Imperial Department should be strengthened, and you have indicated the particular directions in which that should be done?—That is what we want done at once.

38,255. Do you think the initiation, formulation and carrying on of schemes should be done by the central authority?—As regards policy, yes.

38,256. In answer to the Chairman, I think, you said that you were now inclined to regard the creation of an Indian Sugar Board as perhaps not so desirable as it was when the Sugar Committee reported. I notice from your memorandum* that it might be said that the Association is in agreement with the ultimate ideal of the creation of an Indian Sugar Board and of a Central Research Institute?—I was in England when this was drafted, and I did not see it; but perhaps I may say that is my personal opinion; I had better not involve the Association in that.

38,257. That will be gone into in accordance with the Chairman's suggestion when the Report of the Sugar Committee is reviewed and they give a considered opinion?—Yes.

38,258. *Professor Gangulee*: How does the standard of efficiency in manufacturing attained in your factories here compare with that of sugar factories in Java?—(*Mr. Noel Deerr*): At the present moment, of the factories operated by Begg, Sutherland & Company, four of our factories are equal to the Java average, two are a little below, and one of them is distinctly above the Java average at the present moment. Our factories as a whole are very little if anything below the Java average.

38,259 Your Association recommends the opening of sub-stations in the Provinces for testing canes; what are your reasons for that recommendation?—(*Mr. Shakespear*): We believe this part of the work should all be done under one central organisation; a cane which has been proved to be suitable in one district, say Bihar, may not be suitable in the United Provinces, and the testing of different varieties introduced in Coimbatore would have to be done in different areas with a view to seeing whether they were suitable for those areas.

38,260. There are many experimental farms in the Provinces, and those farms could be utilised, perhaps, instead of having new sub-stations?—I believe the experimental farms already in existence could be utilised for that purpose.

38,261. You also say you would like to have a centralised sugar school. Where would you like to have that school?—(*Mr. Noel Deerr*): It would be for the training of Indians in the cultivation of sugar cane and scientific manufacture of sugar. At present, to get that training they have either to go to Hawaii or Trinidad or Louisiana.

38,262. Where would you locate such a school in India? Would you have it at Pusa?—Not necessarily in Pusa. I would not like to give any opinion as to where the school should be located. Pusa would be a good place, because there is already an organisation there; if possible, it should be within reach of factories.

38,263. That would, perhaps, be more convenient?—Yes.

* Not printed. A preliminary memorandum.

38,264. I see that in your note you refer to a number of research problems, especially with regard to plant diseases and pests. I think you express the opinion that such researches should be conducted in the central station instead of in the Provinces; is that your considered opinion?—(*Mr. Shakespear*): Yes, we would like to see that work centralised, at any rate at present.

38,265. Have you any idea how that central organisation should correlate their activities with those of the Provinces in matters of research of this nature?—We based our opinion on what has proved to be so successful in Java, that is to say, that all research work is conducted under the orders anyway of the central organisation, and then the information is made available to everybody connected with the industry; but I do not think that separate efforts are allowed to be carried on by independent officers; the work is all co-ordinated and the policy laid down; that has been so successful and their industry is such a wonderfully organised industry that we think India cannot do better than follow what Java has done.

38,266. Of course, the local conditions have to be taken into consideration in research work?—Yes.

38,267. I see your view is that demonstrations on land leased for short periods from the cultivators are more successful than those conducted on Government farms. Is that based upon your experience?—Yes. Take a field near the village and, if possible, grow the crop yourself and let the cultivator see the difference between his crop and your crop; that is the best demonstration. He will get great practical experience out of that. The man sees what you do and that you are not doing anything to deceive him, that you are not putting more manure than he could afford to do, but you are not ploughing deeper than he does, and so on.

38,268. Once he is convinced, you do not find extra-conservatism in him to take up any new methods?—No. If you prove to him the value of the methods you employ he will be willing to follow.

38,269. What are the chief fertilisers which you use in your farm?—Mostly farmyard manures; also oil cake and sulphate of ammonia; we are also trying super-phosphates, nitrate of soda and cyanamide.

38,270. There is a great deal of scope for sulphate of ammonia as being a suitable fertiliser?—Yes, for the canes.

38,271. Under irrigation or without irrigation?—It should be applied just before the breaking of the monsoon.

38,272. *Mr. Calvert*: On page 497 of the note it is stated that the Association advocates the extension of the co-operative banking system and the enlargement of the existing powers of such banks. Is there any special suggestion there?—We are very much in favour of the extension of the system. I am not quite sure what is meant by the enlargement of the powers. I should think that is a mistake.

38,273. With reference to the Usurious Loans Act, would you care to make any suggestion as to why this Act is not being used?—I do not know why it is not employed; I think it could be employed with great value.

38,274. With regard to the question of marketing, page 498, you raise the question of co-operative marketing of *gur*?—I think that could be brought about.

38,275. The difficulty is of course that the *gur* dealers are better organised than the growers?—Yes.

38,276. Can you suggest any means of getting out of the difficulty?—It is a case of education, trying to educate the village to work as a whole instead of individual people who are in the hands of these dealers.

38,277. Can you do that if the dealers would not buy *gur* from a co-operative society?—We are doing direct purchase now as far as we can, and we hope that by the establishment of a bank we might be able to induce the villagers to sell co-operatively.

38,278. But the difficulty is to get the people to buy?—Yes; and if a village takes independent action and markets its goods everybody boycotts it.

38,279. Can you suggest a way out?—It is a very complex and difficult subject.

38,280. On this question of transport by tramway, the tramway to carry cane would of course prove cheaper in the end if it were allowed also to carry on transport for the public?—Yes.

38,281. But you are up against the Railway Act and the sanction of the Railway Board is necessary?—Yes.

38,282. Have you any suggestions to make with regard to that?—No. Such undertakings would be too costly unless one had a tramway for a considerable distance. Our tramways are about eight or nine miles. We would like to carry other goods in seasons of the year when the line is standing idle. But I do not know whether there is any chance of a relaxation of the Act as regards that.

38,283. It would be of great use to you?—Yes, if we are allowed to carry other goods than our own at seasons of the year when the rolling stock is not fully employed.

38,284. *Sir Henry Lawrence*: Are you acquainted with the statistics of the acreage of cane for a period of years in India? Have you studied whether there has been any increase in the total area or production of cane during the last twenty years?—I believe there has been some increase in recent years in area; of course the yield depends very much on the season.

38,285. Taking the average, do you consider that there is more sugar cane grown and more outturn now than twenty years ago?—Yes, I think so; but I have not got the statistics before me.

38,286. The graph I have before me indicates that the area twenty years ago under cane was an average of 23,00,000 acres; in the following five years, 24,00,000; in the next five years, 26,00,000 and in the last five years, 25,00,000. Do you accept those figures as correct?—I suppose they are correct.

38,287. So that in twenty years there has been an increase of not more than 8 per cent.?—Yes.

38,288. That will indicate that, although irrigation has increased very largely in these twenty years, the area under cane has not increased appreciably. I make that point with reference to your suggestion that the cane cultivator is greatly interested in the present import tariff?—Quite.

38,289. If that tariff were removed, the cane cultivator would probably suffer; is that your opinion?—Yes.

38,290. Your industry represents only some 3 per cent. of the total outturn of sugar in the country?—Yes; it is very small at present.

38,291. There is a recommendation in the Taxation Enquiry Committee Report that the tariff should be removed. You think that would be injurious to the cane cultivator?—Yes, it would undoubtedly affect cultivation.

38,292. Can you tell us to what extent white sugar is at present made by the cultivator in small mills of his own? Is there any such white sugar made?—Yes, a certain amount of hand-made sugar; but I think the taste for them is passing away.

38,293. That is found chiefly in this Province, is it?—I think it is also made in Bombay to some extent.

Messrs. Shakespear, Ryan and Deerr.

38,294. Is that being killed by the Java importations?—Yes.

38,295. What is the present proportion of the Java importations to the factory-made white sugar?—About 10 to one.

38,296. So that the inference would be that the small hand-made concerns are being destroyed by the importation of Java sugar; is that your view?—Yes; perhaps it may be also that the people's taste is changing; new tastes are arising. The hand-made sugar has got a special flavour.

38,297. An attractive flavour or a repulsive flavour?—It has got a peculiar flavour.

38,298. Can you tell us anything about the conditions in which the Java factories work? How do they obtain land? Is that controlled by Government in any way?—There is a minimum prescribed rent which they must pay to the communal societies from which the factories lease, but otherwise they can arrange their own terms. The land is taken over for a certain period, and it is handed back to the villages and then other land is taken in exchange. I think in the old days the Government interfered, but I do not think there is any interference now from the Government except that a minimum rent is laid down.

38,299. *Sir Ganga Ram*: Is sugar machinery imported into India on the same terms as agricultural machinery? What I am told is that sugar machinery gets no favourable rates as agricultural machinery does? Is that the case?—It does not get the benefits which are accorded to agricultural machinery.

38,300. Not even in railway freights?—None whatever.

38,301. Has your association never considered that point with a view to reduce the cost of erecting sugar factories?—We have never taken up that point. We sometimes by special treaty obtain a special rate from a railway company for the carriage of the whole of a factory plant, but as a general rule we have not taken up that question.

38,302. You said that out of the tariff which is made by the Government something might be given to the Association? Would you go still further and recommend some bounty to the sugar factories?—No, but we would ask it to be devoted to the work of improving the industry, not that it should be given to us.

38,303. But would you support the idea of a bounty being given to the people who erect sugar factories?—No.

38,304. Why not?—I do not think that we deserve any bounty, but we would no doubt be very glad to receive it if it is given to us.

38,305. But that is not a new thing; it is followed in other countries?—Yes, I know that; but often bounties are very mischievous things.

38,306. Who does not your Association take up the idea with a view to promoting its industry?—We would be very glad to accept a bounty if it was offered but I do not think we could make out a case for a claim.

38,307. Again would you support the idea of giving a rebate to people who grow cane and sold it to the factory owners?—As against converting it into raw sugar.

38,308. Yes?—I do not think Government could differentiate.

38,309. All I want to know is whether you support that idea?—Yes.

38,310. You said that in Bihar the fertility of the land on which cane is grown is decreasing; is that so?—That is the opinion of some of the planters in those parts.

38,311. Do they grow cane every year, or do they follow a rotation system?—They generally follow a system of crop rotation. In cases they first grow

cane, and then fallow; then again cane, after that a green manure crop; and then again cane, or alternatively there is cane and some leguminous crops intervening for two seasons and then cane again.

38,312. What is the percentage of the total gross area which has been put under cane in Bihar?—No district in Bihar is so heavily cropped as the districts of Gorakhpur and Meerut in the United Provinces, in the former of which I believe 7 per cent. of the cultivable area is under cane.

38,313. *Sir Thomas Middleton*:. With reference to the duties on sugar machinery, is it not the case that mills which are to be worked by manual or animal power can be imported free?—Yes, that is the case with the small mill.

38,314. On page 496 of your memorandum you express the opinion that more institutions and instructors are needed. What type of institution had you in mind there? Were you referring to farm schools?—Yes.

38,315. I infer from a perusal of your memorandum that you agree that itinerant instructors are what you chiefly want at the present time?—Yes, instructors in connection with cultivation methods, or fieldmen I would call them.

38,316. You point out that a centralised sugar school is required for sugar technology. Would any factory be required in connection with that school?—We would want a small demonstration plant.

38,317. Semi-commercial plant?—There is a scheme for such a school at Cawnpore.

38,318. Have you any estimate of the cost of such a school?—I think Dr. Watson's budget was about Rs.1,00,000.

38,319. Have you any idea as to how many men could be absorbed by your industry if they were trained in that school?—We gave Dr. Watson some figures, and I think we said that we could take some six students a year till we got to the absorption point.

38,320. When would you get to the absorption point?—We would expect to get to the absorption point in the case of our established factories in about four years.

38,321. I am thinking of the number of students for which there would be an effective demand in the country. There is no use setting up a school if there is no demand for pupils?—There is a demand undoubtedly.

38,322. And that is about six a year?—For our own group of course we would take six a year, until we filled our factories.

38,323. Let us hear what you would do?—Our idea would be to place them in the first instance in charge of stations in the factory, such as mill houses, etc., and there would always be a chance of their promotion to supervisors. I should think that about 25 would be the number which could be taken on in four years.

38,324. *Professor Gangulee*: How long would you train them in the school?—They would go through a four years' course, the degree of B.Sc. being the qualification required.

38,325. What salary would they draw after coming out of the school?—About Rs.150 to start with and they would be placed in charge of stations.

38,326. *Sir Thomas Middleton*: When you said that you could see a demand for 25 for your group of factories, did you mean all the factories represented on your Association?—No, I am talking of our own group. But you could almost double it for the whole Association, that is, you could make it 50.

38,327. On page 497 of your memorandum you suggest the introduction of legislation limiting the right to mortgage immovable property, except to recognised banks and credit institutions. What is a recognised bank or credit institution?—We mean the co-operative banks, but it may include a private bank provided it satisfied the conditions.

38,328. Would that not be very likely to limit the facilities of a cultivator for getting his working capital?—It is no use trying to knock down one system until you have got another system to take its place. We would like to see an extension of the co-operative bank system because we know from our own experience how great its value is.

38,329. Would you like to see legislation to restrict the term of mortgage to say twenty years, capital being repaid by sinking fund?—Yes, I think that would be a suitable compromise.

38,330. Have any of the factories which you represent made use of the Adco process in connection with their farming operations?—No, but we are taking it up now. I am already in correspondence with the Adco people and I expect in a very short time to have it under control.

38,331. You have been making a good many experiments in manures in your group of factories?—(*Mr. Noel Deerr*): Yes, we have been doing it for three years now and at the end of this third year we hope to get some definite results. We have got three large series of experiments on fertilizers under operation this year and at the present moment the results are being harvested.

38,332. Would you let us have the results when they are completed?—Yes.

38,333. You advocate a system of plant quarantine and control. What are the existing arrangements? Are they not satisfactory?—(*Mr. Noel Deerr*): I am not sure that there is any extensive system of plant quarantine in India, but I do know that there is a quarantine against the importation of cane into India to this extent that all the cane imported into India has to be imported through the Sugar Bureau. Owing, however, to the possible danger of the introduction of harmful insects and plant diseases I should like to see the system of quarantine which now exists very rigidly enforced, in fact more rigidly enforced than is the case at the present moment.

38,334. You have not yourself actually come across any cases in which the quarantine has proved to be insufficient?—(*Mr. Noel Deerr*): No.

38,335. You suggest the strengthening of the Pusa Institute for dealing with the cane problem centrally, but there are many cane problems that must be dealt with locally. Take for instance the testing of those canes which are bred in Coimbatore?—Certainly, but under the direction of Pusa or through a Central Board which would dictate the policy.

38,336. The testing of a local cane is a business for the local man, but he would be directed by Pusa to make the test and to report on the quality? —Yes, the central authority would dictate the policy to be followed.

38,337. Similarly with insect pests and with the fungus pests on cane? These subjects must be studied locally? Your idea is that there should be one policy, directed from Pusa?—Yes.

38,338. What does your Association itself spend on research? Do you employ chemists?—(*Mr. Shakespear*): The Association does not employ any staff at all.

38,339. The individual concerns employ chemists?—Yes.

38,340. The Association as a body does nothing of that sort?—No.

38,341. Has your attention been directed to the development of Industrial Research Associations in Britain? Industries have come together, put up

schemes to the Department of Scientific and Industrial Research and got grants-in-aid for work to be done under officers appointed by the industry?—I know of the movement, but I have not examined its working.

38,342. Nor have you thought of any such scheme in connection with your sugar problems in India?—No.

38,343. Are there not problems in sugar technology which arise quite independently of the growers' problem?—Yes, manufacturing problems.

38,344. Each of you is dealing with these problems independently at the present time?—Yes. There is no co-ordination such as they have in Java.

38,345. Or such as they now have in Britain?—None whatever.

38,346. Reference was made to zones for factories. Could you give a rough indication of the size of zone which would be suitable under the conditions of Bihar or the United Provinces?—About a 10-mile radius for a factory of moderate size.

38,347. What do you regard as being the ideal size for a factory to suit Indian conditions?—The biggest we have is for 15,000 maunds a day of cane crushed.

38,348. What would be the smallest size which could be successful?—6,000 maunds a day is the smallest we have.

38,349. Do many of your factories grow a large proportion of the cane which they work?—No. We only grow a small proportion.

38,350. What would be the largest proportion grown by any group of factories?—In one case 30 per cent. It will be 40 per cent. next year.

38,351. That is exceptional?—Yes. In our case it is about 10 per cent.

38,352. The general rule is to purchase cane from cultivators?—Or from planters.

38,353. Under contract?—Yes.

38,354. *Sir Ganga Ram*: You know the figures for refined sugar made in this country. Can you tell us how much of that is made direct from *gur* and how much from cane? Are those figures available?—Yes, and I will obtain them and send them to you.*

(The witnesses withdrew.)

APPENDIX I.

STATEMENT A.

The Association has obtained the following information by the courtesy of the Secretary, Sugar Bureau, Pusa:—

Production by Sugar Refineries in India.	1924–25.	1925–26.
	Maunds.	Maunds.
Gur melted	1,798,406	1,545,698
Sugar made	888,859	802,413
Molasses obtained	698,359	580,216

* *Vide* Appendix I.

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STATEMENT B.

Production of sugar by the sugar factories in India.

Years.	Sugar direct from cane.	Sugar refined from *gur*.
	Maunds.	Maunds.
1919–20	628,920	1,211,274
1920–21	669,291	1,324,646
1921–22	753,638	1,303,433
1922–23	651,415	1,368,126
1923–24	1,044,856	1,538,304
1924–25	921,950	888,859

Reference may also be made to page 405 of Part V, Vol. XXI, of the *Indian Agricultural Journal*, September, 1926, where, in an article by Mr. Kasanji D. Naik, of the Sugar Bureau, Pusa, figures of sugar production from *gur* in (1) the United Provinces, (2), the Madras Presidency and the Punjab, and (3) the whole of India, respectively, during 1923-24 and 1924-25, are given, as also some interesting figures of the cost of refining *gur* and Java sugar respectively. References are also given to the quantity of sugar produced by factories making sugar direct from cane.

APPENDIX II.

Observations on the Report of the Indian Sugar Committee by the Indian Sugar Producers' Association, Cawnpore.*

In general, the Association accepts the recommendations of the Indian Sugar Committee, though in certain points, we think, their conclusions are deserving of modification in the light of present conditions.

As regards local administration problems, the Association does not express any opinion.

2. The Association is at one with the recommendations regarding the necessity for research and is of opinion that research for the benefit of the sugar industry in India should be under the control of one centralised body. The testing of the results of research and their presentation to the public may suitably be deputed to localised authority, the policy to be followed in testing to be dictated by the centralised body.

3. The Association advocates the establishment at as early a date as possible of a Sugar Board, the constitution of this Board to consist of:—

The Agricultural Adviser to the Government of India.

The Director of Commercial Intelligence.

Three Provincial Directors of Agriculture (or officers deputed by them); the various provinces to be represented in rotation.

One representative of the manufacturing industry.

One representative of the larger cane growers.

One member to represent the interests of the small cane grower and manufacturer of raw sugar.

One member to represent trade interests.

The members to be appointed for three years, with opportunity of re-appointment.

The Association desire to emphasise the importance of the very early constitution of the Board.

* These observations are the views of the majority of the members of the Indian Sugar Producers' Association.

4. The Association is of opinion that research for the benefit of the sugar industry may conveniently be merged into the Institute at Pusa and become a part thereof. Exception should be made, however, with regard to cane breeding, which, the Association thinks, may best remain located at Coimbatore.

5. The Association is of opinion that the lines of research to be followed up should embrace:—

(*a*) The study of soils and of their fertiliser requirements and of the appropriate rotations to be followed. This study should include fertiliser plot experiments in the different cane-growing areas.

(*b*) The study of irrigation as applied to cane and the best means to render available to the small cultivator sources of water such as that from wells, small rivers, lakes and tanks.

(*c*) The study of the engineering and manufacturing probems as they concern the small producer of *gur*. This department would study the best design of mills, of furnaces, pans, etc., in the interest of the small producer. It would also attack the problem of community central factories for a village or group of villages.

(*d*) The study from the economic view point of the various insect pests which attack sugar cane and the formulation of means effectively to control these pests.

(*e*) The study of the various fungus diseases of the sugar cane and of prophylactic methods to be employed in their control.

(*f*) The continuation and extension of the cane-breeding work at Coimbatore, attention being paid towards breeding cane suited for different types of soil, rainfall, climatic conditions, of different periods of maturity and of resistance to fungus diseases. The testing of canes so bred would be deputed to the various provincial agricultural departments for testing and distribution when found suitable.

6. The Association considers that the Sugar Bureau should be made a permanent institution, to be carried on under the direction of the Pusa Institute.

7. The Association is of opinion that whole-time officers should be delegated to the work of sugar research, and that the personnel should consist of:—

A Sugar Engineer with knowledge of manufacturing processes,
An Economic Entomologist,
And a Mycologist,

with the appropriate subordinate staff.

If accommodation and equipment are not immediately available at Pusa, the Association would urge the necessity of a grant to enable this work to be initiated without delay.

8. The Association suggests that the funds for creating and carrying on this work be obtained by appropriating some small portion of the revenue now raised from the sugar import duty.

9. The Sugar Board should be provided with executive powers, and the utilisation of the special funds allotted for the programme should be entrusted to the Board. From the money so obtained grants might be made to Provincial Governments to carry on testing and experimental work under the direction of the Sugar Board, either at sub-stations to be established at selected sites in each province, or at the existing provincial stations, and particularly the Farm at Karnal might be so utilised.

10. The Association does not think that the recommendation of the Sugar Committee to establish a Government pioneer factory for Upper India is advisable. This has already been done by private enterprise, and there are already operating in Upper India factories, which, on any standard of

equipment and efficiency, would be considered creditable in any part of the world. These factories would be available in case the Sugar Board wished to demonstrate some new process or the results of any particular research. The Association also does not consider necessary the demonstration sugar factory included in the Committee's working scheme, but they would like the project for a sugar class in connection with the Technological Institute at Cawnpore to be proceeded with. They also think it advisable that a similar technological course be instituted in Madras.

11. In connection with the research scheme, the Association advocates the granting of a certain number of studentships to approved candidates who hold the B.Sc. degree, for training in the technique of cane cultivation and in the study of cane diseases and pests who would carry out their course at Pusa. The Association thinks factory owners would be prepared to give students undergoing a sugar course at the Technological Institute, Cawnpore, or similar institutions in other parts of India, a season's training in practical sugar technology, but to enable this to be carried out it will be necessary for the Sugar Board to allot funds to provide for suitable accommodation at the factories selected for this purpose.

12. The Association is also of opinion that a periodical devoted to technical information regarding sugar cane cultivation and sugar manufacture would be of value. If this were initiated the articles of this phase of agriculture now appearing in the *Agricultural Journal of India* would appear in this suggested Journal.

APPENDIX III.

Economic loss to India following on present methods of manufacture and cultivation.

The acreage under sugarcane in India is about 2,750,000 acres from which at 10 tons canes per acre, there is produced 27,500,000 tons cane.

With the two-roller bullock mill, a yield of 10 per cent. *gur* on cane is a general average outturn indicating the production of 2,750,000 tons *gur* per annum.

Taking the value of *gur* as Rs.140 per ton (Rs.5 per maund), the value of this production is Rs.38,50,00,000 (38½ crores of rupees).

The 27,50,00,000 tons of cane treated in a modern efficient factory would give, at least, 2,475,000 tons direct consumption sugar and 9,02,500 tons molasses.

Taking the selling price of sugar at Rs.330 per ton (roughly Rs.12 per maund), the value of the sugar is Rs.81,67,50,000.

If molasses is valued at Rs.55 per ton (roughly Rs.2 per maund) the value of the molasses is Rs.4,96,38,000.

The total of these is Rs.86,63,88,000 whence has to be deducted the value of the *gur*, or Rs.38,50,00,000, leaving a difference of Rs.48,13,88,000, or roughly 50 crores, and this represents the economic loss to India following on present methods of cultivation and manufacture.

If it is also considered that by the introduction of new varieties of cane and by improved agricultural methods, the yield of cane per acre could be doubled, the economic loss will amount to approximately double that quoted above and will be of the order 100 crores.

This statement does not consider, in any way, the capital cost of factories to manufacture the sugar which could be produced from this quantity of cane. To treat the whole 27,500,000 tons cane would require 300 factories of a capacity 800-1,000 tons cane per day and the capital cost of these erected and ready to work would be about £50,000,000 sterling.

APPENDIX IV.

Improvement in manufacturing conditions.

This is shown in the following statement comprising the results of one group of factories (in percentages):—

Year.	A Yield cane.	B Yield cane.	C Yield cane.	D Yield cane.	E Yield cane.	F Yield cane.
1907–08	6·0	—	—	6·3	—	—
1908–09	7·0	—	—	5·7	—	—
1909–10	6·4	—	—	6·0	—	—
1910–11	7·0	—	5·6	5·0	—	—
1911–12	6·6	—	6·3	6·0	—	—
1912–13	7·5	—	7·9	6·7	—	—
1913–14	7·0	—	7·0	6·6	—	—
1914–15	7·6	—	7·5	6·1	7·2	—
1915–16	7·1	—	6·6	5·1	7·2	—
1916–17	6·9	—	7·4	5·7	7·9	—
1917–18	7·1	—	7·6	5·5	8·1	—
1918–19	7·4	—	8·0	6·2	8·5	—
1919–20	7·2	5·7	7·8	6·0	7·7	—
1920–21	7·8	6·9	8·6	5·7	7·9	5·6
1921–22	8·0	7·1	9·6	6·2	7·5	7·3
1922–23	8·4	6·8	9·5	7·1	8·0	7·6
1923–24	8·2	6·2	9·1	7·5	8·4	9·2
1924–25	8·6	7·5	9·7	7·9	8·4	9·0
1925–26	8·4	8·3	9·5	8·6	7·9	9·2
1926–27 (Estimate)	10·2	8·5	10·3	8·6	9·0	9·3

Of the factories in this group, two are now operating at an efficiency which would be considered superior in Java, two are quite equal to good Java practice and two are a little below.

APPENDIX V.

Zone system as applied to sugarcane cultivation and manufacture.

The agricultural economics of sugarcane cultivation differ from those of most other cultures in that there is produced a highly perishable commodity which has to be worked up without delay by means of expensive and complicated machinery.

By the zone system is meant the allocation of certain well-defined areas to a central factory, that factory alone having the right to purchase cane and to manufacture sugar in that area. Under this system, each factory would receive, in a sense, a licence from Government for this purpose.

At the present moment, in the district of Saran and in the immediately contiguous parts of the United Provinces, there are ten central factories, all competing for cane in this area, and at some stations, as many as six weighbridges are in operation. Some of these weighbridges are located over 100 miles from the factory and serious economic loss obtains, not only following on the payment of unnecessary freight, but also from pilferage and deterioration of cane *en route* which is particularly severe during the latter part of the cane season.

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In one particular instance, a pioneer firm has built up a substantial business and more than any other has established a stable industry, not only to their own benefit, but also to the material advantage of the small holders within a radius of twelve miles from the factory. At the present moment, recently constructed factories are purchasing cane within a few miles of the pioneer factory and are transporting it, in some cases, as far as 100 miles. Although the grower is a free agent and under no contract to the pioneer factory, the latter cannot fail to feel some resentment and to regard its new competitors as interlopers. An objection which could be raised against the zone system is the lack of competition which would result and which might place the small grower under the control of a central factory, this latter taking advantage of its position to force down the price of cane to the detriment of the grower. A policy so short-sighted would soon result in the refusal of the grower to supply cane, and it is recognised that the establishment of a cane sugar industry depends on the mutual co-operation of the factory and grower, both sharing in any advance of prices and suffering equally when prices fall. In a complete zone system the price paid for cane might be formally fixed by agreement on a sliding scale dependent on the price of sugar.

A zone system would also protect that factory which develops cane cultivation in its vicinity. A factory is unlikely to help the cultivator if it is exposed to having the results of its labour appropriated by a rival factory which has done nothing towards development.

SYED TOFAIL AHMED, Retired Sub-Registrar, Aligarh.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—About 92 per cent. of the population of India being illiterate, no improvement in agriculture or any other industry is possible. There being very little difference of intelligence between the tenants and the oxen they use in their ploughs, it is useless to expect that they would understand and appreciate the new methods of agriculture without which there can be no improvement at all. I wish the members of the Royal Commission would devote their foremost attention to the most important question of increasing literacy among the peasants. I have read in papers that in seven years the percentage of literate persons in Russia has been raised from 7 to 93 per cent.; I suggest a ten-year programme be made for future work, according to which literacy may be increased in this country to as great an extent as possible.

The next question is that of the subjects to be taught to the rural population, and it is evident that there should be no education of peasant boys without the subject of agriculture in their course.

In this connection, I may say that the greatest requisite is the supply of sufficient funds for the purpose, which may kindly be recommended by the members of the Royal Commission.

I lay some literacy figures of the United Provinces, before the Commission, which would show that the rate of our progress in literacy is exceedingly slow.

In the Census of 1891, our literary figure was 3·2 per cent., and the Census Commissioner of that time made the following remarks about our Province:—

> "N.W.P. (as it was called in those days) enjoys the distinction of being the most illiterate of the great Provinces of India. It is surpassed in this respect only by the backward Province of C.P."

Now I will try to show if there has been any progress in literacy since 1891:

In 1891	the literacy	was	3·2	per cent.
,, 1901	,,	,,	3·1	,,
,, 1911	,,	,,	3·4	,,
,, 1921	,,	,,	3·7	,,

This shows that from 1901 we raised our literacy at the rate of ·3 per cent. per decade or 1 per cent. in 33 years. And if we go on at this rate we will reach the literacy of the Indian State of Mysore (7·4 per cent.) in 122 years; that of Baroda (12·8 per cent.) in 297 years, and if the figures of Russia given in the papers be correct (94 per cent.) we expect to reach that literacy in a long period of 3,000 years.

By this I only mean to say that if the progress in literacy is not accelerated, no improvement in agriculture is possible.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—Borrowing is a necessity of all business. It is not an evil, provided it is done for productive works and money is obtained on moderate interest. In this country the rate of interest is heavy, hence it is difficult for cultivators to pay even the interest due, leaving aside the principal. Under the circumstances, cultivators have to borrow not only for improving their productive works but also for their daily requirements of food not to speak of clothing, as they have to remain half naked all the year round.

Hence the greatest need of the cultivator is that they be supplied with money at low rates of interest. That can only be done by Government. The Government may raise loans from the people in large amounts and may start not only co-operative banks, but banks of all sorts, agricultural banks, savings banks in villages, so that the villagers may know to save and to deposit money, may easily get money for productive works at all times and

thus money may be in circulation. This is the only means by which rate of interest can be lowered.

Co-operative banks are the chief remedy of the evil of indebtedness, but their progress is slow. So I have proposed above that the Government may raise loans and start their own banks in rural areas. The Imperial Bank and some other banks advance money for business purposes in some commercial towns. The same sort of banks, started and worked by the Government, may, in the above named manner, advance money to cultivators for agricultural purposes and receive deposits so that villagers may learn economy and begin to take interest in saving money. It is often complained that Indians are addicted to hoarding money and keeping it under the ground and converting coins into golden jewellery. But the fact is that they are not taught to invest and villagers are not given facilities for depositing their money in saving banks. At present if they happen to earn money the only uses they know of it are: (1) spending away on personal comforts, (2) hoarding, and (3) spending it away in marriages and feasts.

QUESTION 14.—IMPLEMENTS.—(*a*) I am very much in favour of the introduction of new implements, without which there can be no improvement in Indian agriculture.

(*b*) and (*c*) The poor cultivator has no means to purchase costly implements. So I propose that arrangements may be made to give the implements on hire-purchase system like Singer's sewing machines or on simple hire like sugarcane crushing machines, which are very successful in India. Without adopting such measures, it would take very very long to introduce new implements and machinery in this poor country.

QUESTION 15.—VETERINARY.—(*c*) (i) The veterinary dispensaries are in the headquarters only and thus are out of the reach of villagers. The veterinary doctors go about in villages without medicines and thus can be of little use to villagers.

(ii) I do not think there are touring dispensaries in United Provinces for veterinary diseases. The doctors for men are supplied with a stock of medicines and tents, which they pitch in some central village and stay there for some days and attract patients in this way, whereas veterinary doctors go about the villages without any medicines or tents and can do very little good.

QUESTION 24.—ATTRACTING CAPITAL.—People generally do not know that agriculture with new implements is the best investment in the country. I am impressing this point in my monthly paper called *Goodman*, and I think propaganda should be made by Government to the same effect on a large scale.

QUESTION 25.—WELFARE OF RURAL POPULATION.—For the promotion of the general well-being of the rural population, it is necessary to have very good roads and other means of transport. At present there are very few *pucca* and *katcha* roads, and the latter are in the worst condition. I am doubtful if the money allotted for their annual repairs is fully spent or not. I suggest some inspecting agency be appointed to see if they are properly repaired. At present *katcha* roads are sometimes lower than the adjoining fields on both sides and serve as drains in the rainy season and in some cases to travel on them by boat is easier than by cart.

Oral Evidence.

38,355. *The Chairman*: Mr. Tofail Ahmed, you have been good enough to provide us with a note of the evidence you wish to put before the Royal Commission. Have you anything you would like to add at this stage?—There are some further suggestions I would like to make.

38,356. We are prepared to hear them now, or you might prefer to embody them in a supplementary note which we would add to your evidence?—I would prefer to do that.

38,357. That is probably the best way. What are your own occupation and interests?—I am a Government pensioner, having been in Government service 32 years. I was a Sub-Registrar in the Registration Department.

38,358. I think you now conduct a newspaper?—Yes, with the object of persuading people to invest their money in productive works, and especially of persuading Mohammedans to take up commercial interests.

38,359. Trying to stimulate interest in industrial investments?—Industrial, commercial and agricultural investments.

38,360. Are you proprietor or editor of this paper?—Both. It is only a monthly magazine.

38,361. What authority have you for the statement that in seven years the percentage of literate persons in Russia has been raised from 7 to 93?—That statement was made by Mr. Saklatvala in the House of Commons and was not contradicted there.

38,362. In your memorandum you emphasise the importance of a supply of sufficient funds for the purpose of education. You suggest that this Commission might recommend the granting of funds. From what source do you suggest these funds should come?—I do not think that is important, because whatever taxation Government imposes has to be paid. We pay taxes of all sorts every day.

38,363. I want to be clear that you agree with me that there are no sources from which funds can come except new taxation or an alteration in the allotment of existing revenues as between various subjects?—Yes.

38,364. You know, of course, that Government has not got a large heap of money of its own to give away?—Yes, but it can raise money by taxation or by curtailments in other directions.

38,365. In the interests of accuracy I should like you to look at the statement on page 518, which says: "if the progress in literacy is not accelerated, no improvement in agriculture is possible." It is, I suppose, a fact that various contributions to agricultural progress have been made quite apart from educational improvement?—Yes.

38,366. So that that statement is not quite accurate?—In my opinion, progress in agriculture or industry depends on decreasing the cost of production so as to be able to compete with foreign countries. By increasing literacy we shall get good and efficient workmen who will be able to do more and better work than illiterate men. That will help to reduce the cost of production. The second point is working capital, and the third research. I lay great stress on increasing literacy and providing capital at lower rates of interest.

38,367. What is your experience of the co-operative movement?—I have no personal experience. I have read about it, and consider it a very good idea. It has been very successful in the Punjab.

38,368. Have you any experience as a practical farmer?—My cousins are farmers, and I have seen their work. I myself am a landowner.

38,369. Do you farm your own land?—No; I have been in Government service and could not do so. My cousins do it.

38,370. *Sir Henry Lawrence*: Do you expect there will be any decrease of revenue from the Excise Department in future?—I do not think so.

38,371. You are not in favour of prohibition?—We may make laws about it, but it will be impossible to carry them out.

38,372. It is not a practical policy?—No. In the long run it would be impossible to enforce.

38,373. So that you are not afraid that the provincial revenues would show a serious falling off?—I do not think so; with the increase of modern civilisation we do not expect any decrease.

38,374. Have you any definite proposal to make as to the source from which additional revenue can be obtained for expenditure on agriculture?—No; I do not know whether it may be done by taxation or reduction of expenditure under some other head; it must be done by whatever means are agreeable to the legislature and the Government; I do not make any suggestion, but I do say that when Government wants to do anything it can do it.

38,375. You have great faith in the Government?—In the power of Government.

38,376. *Rajah Sir Rampal Singh*: I should like to know what grounds you have for saying in the first paragraph of your note that our tenants have no more intelligence than the oxen with which they plough?—It is quite evident. Of course, a literate man is more intelligent.

38,377. Yes, of course a literate man is more intelligent, but even illiterate tenants know their own interests?—They are not prepared to accept anything new; they do not like to use new implements, and they will not give up their old customs.

38,378. Is it not within your experience that they are now freely using sugarcane mills?—Very little.

38,379. And chaff cutters?—Yes, they are. With regard to that, I have suggested that such machines should be supplied on the hire-purchase system.

38,380. But if they cannot understand their own interests, will they take such things?—These things are petty things compared with the scientific knowledge of European and other advanced countries, because so far as I have been able to learn, a peasant of an advanced country can do six times the work that our peasants can do, on account of their intelligence, and, as their machinery can do twenty times the work of a man, in that case an intelligent worker can do a hundred times the work our illiterate tenants can do. Our illiterate peasants are not prepared to adopt new machinery, and they are not skilled labourers. I mean that by the introduction of primary education we could increase the efficiency of our labourers and turn unskilled labourers into skilled labourers.

38,381. There are some men in the villages who have got sufficient primary education; have they been able to do anything?—It depends upon mass education; a few men cannot influence society; our educated men have not influenced society because they are small in number. In the villages only 1 per cent. or less of the people are literate. The general rate of literacy has been raised by the literacy of the urban population to 3 per cent., but in the villages the literacy is less than 3 per cent. Unless we raise the percentage of literacy we shall not be able to increase the efficiency of the peasants.

38,382. *Mr. Calvert*: As Sub-Registrar you have dealt with a large number of mortgages?—Yes.

38,383. Were those mortgages to any large extent on land passing from cultivators to moneylenders?—Yes, a very large number.

38,384. Is that on the increase?—Yes.

38,385. What are the usual reasons for mortgages of land passing into the hands of moneylenders?—High rate of interest, and the people not knowing how to invest in productive works.

38,386. As far as you recollect, was it frequent for a man to mortgage his land in order to get working capital for his cultivation?—Yes.

38,387. That was frequent?—Yes, both for cultivation and for marriages, and so on. When they take money from the Registrar's office they spend most of it on personal matters; very little is spent in purchasing seeds and that sort of thing.

38,388. Very little of the money raised by mortgage is used for actual cultivation?—That I cannot say definitely; I cannot say what proportion is spent on personal comforts.

38,389. In your experience, is the mortgage with the conditional sale clause still common?—No.

(The witness withdrew.)

Dr. GILBERT FOWLER, Head of the Research Department, Government Technological Institute, Cawnpore.

MEMORANDUM.

1. *The possibility of educated middle-class Indians obtaining a living from the land.* (*Question* 2.)

At Nasik (Bombay Presidency) I have been associated with two educated Indians (Brahmins), one a student of my own and one a fully-qualified student from Poona Agricultural College. They had land of their own, some 11 acres being under fairly intensive cultivation. My younger son, also qualified in agriculture, being then without occupation, I took up a mortgage, after consulting the local Collector, on four acres of land, including a well belonging to the Indians aforesaid, so that my son might have an interest in the concern. I provided them with sufficient funds to procure the necessary manure, and two acres were planted with sugar-cane and the remainder with wheat and sundries. The well failed, as happens once in perhaps seven years, and practically the whole crop failed also. It is evident that provision of adequate capital means that there must be enough to tide over a certain average percentage of famine years.

Such capital as my friends commanded was borrowed at 12 per cent. (except my mortgage at 8 per cent.). They worked hard against many difficulties, living in a small shanty on the farm, but the end of the story is that one brother has obtained a position as a research worker and the other is seeking for one. My son has a good appointment on a tea estate in Assam. An adjacent farmer who desired the four acres to complete his holding has taken up the mortgage, so that no loss has been sustained.

Minor experience on my bungalow compound of one-sixth of an acre has emphasised the conclusion that without adequate working capital such expenditure as is incurred is to a large extent thrown away. (Details can be given in corroboration.)

To summarise, lack of *adequate working capital* is the chief bar to success of non-wealthy middle-class Indians settling on the soil.

The difficulty is not peculiar to India. I am not in a position to give an opinion of value as to how the situation can best be met.

2. *The preparation of "composts" from various materials.* (*Question* 10.)

Detailed description can be given of the preparation of composts from night soil and *kutchra*, and from cattle urine and *kutchra*, weeds, &c. Actual experiments in operation can be shown to the Commission The object of the researches has been by the preparation of a "starter" or "activated" product, in the first instance, greatly to accelerate the rate of production of the "compost."

Experiments by Dr. Rege at Bangalore, made under my direction (an account of which is submitted herewith) indicate that under controlled laboratory conditions, the nitrogen from ammonium sulphate can be converted into "organic" nitrogen in 24 hours.

Researches by Dr. Rege at Rothamsted have thrown much light on the biochemistry of "compost" production, and experiments are being made, under instructions from him in the compound of my bungalow at Nasik. It has been evident that many waste materials (dead leaves, &c.) of use for "compost" making are seldom properly utilised.

Apart from the well-known use of cowdung as fuel, the even more valuable cattle urine is largely wasted at present, but could readily be used for "compost" making under scientific control.

I would strongly recommend a general survey, district by district, wherever possible, of the potential manurial resources in cattle manure (particularly urine), night soil and *kutchra* of various kinds. Such a survey has been made for the principal towns and large villages in the Nasik district of the Bombay Presidency.

3. *The advantages of the Activated Sludge process as a preliminary to land treatment, and of the utilisation of the tanks as "dumping" tanks as a means of obviating the necessity of trenching grounds.*

The Activated Sludge process of sewage purification is now well known, but a descriptive pamphlet by Captain C. C. Adams is enclosed, together with a more purely scientific pamphlet by myself on the "Conservation of Nitrogen."

The process was officially reported upon to Government by Sir John Russell during the War, and his report was entirely favourable. He valued the sludge (dried) at about £3 10*s.* per ton, and when I saw him personally last year that was still his opinion. It has, in fact, been sold in quantity in the United States for that price. Its conservation is thus evidently desirable.

Statistics kindly furnished me by the Sanitary Engineer to the United Provinces show that none of the large sewage farms in the Provinces are actually treating more than a fraction of the sewage received. This is a not infrequent phenomenon in other countries, since the claims of agriculture and sewage purification cannot be made to fit.

Moreover, the direct treatment of sewage on land, unless conditions are exceptionally favourable (as *e.g.*, at Karachi) is seldom long successful. The raw sewage (often in a highly putrescent condition) makes a great demand on the oxygen present in the soil and defective aeration occurs with the well-known results. Where the land is unsuitable for sewage treatment serious disaster may ensue, as, *e.g.*, at Nagpur, where several hundred acres of good land have been reduced to a morass of sewage weed on which nothing will grow.*

The effluent from the activated sludge tank is clear and well oxidised and cannot clog the land. The sludge can be used as required, or dried and sent to where there may be a special demand, *e.g.*, among sugar planters.

To use the tanks as "dumping" tanks a local water supply would be necessary. Given that, the tanks can be so constructed that the night soil baskets can be "dumped" directly into preliminary "macerating" chamber where the contents become liquified and homogeneous before passing to the aeration tanks. In this way, the insanitary "trenching ground" in which most of the nitrogen is lost, can be dispensed with.

* A communication was received from the Director of Agriculture, Central Provinces denying that the farm was in the condition represented by the witness.

38,390. *The Chairman*: Dr. Fowler, you are Officiating Head of the Research Department, Government Technological Institute, Cawnpore?—Yes.

38,391. Would you tell the Commission a little about the working of the Technological Institute?—It is under the Department of Industries.

38,392. Is it linked at all with the Agricultural Department?—Not as far as I know. You must understand I am not a Cawnpore official; I am only a temporary man.

38,393. On what basis exactly are you connected with the Institute? Is it on a temporary basis?—Yes. When Dr. Watson who has now passed away went on long leave I was simply asked to officiate in his place during his absence. I may perhaps inform the Commission that I am a retired Professor from the Indian Institute of Science where I was for eight years.

38,394. And then I think you undertook certain investigations in a private capacity, did you not, before you came here?—Yes.

38,395. Were you not at that time in Government service?—No. Between leaving Bangalore and coming here I had no official association with Government whatever although I worked a good deal with Government officials in Bombay.

38,396. When you were at Bangalore on what problems were you engaged?—On quite a variety of problems. My main activity—and a large part of my professional life has been spent on it—has been the purification of sewage. I developed that among other things in Bangalore. But when I first went there I was concerned with the production of acetone and general fermentation problems of all sorts, including manufacture of vinegar, for example, and in fact all the main problems that would come under the head of bio-chemistry. For five years I was Professor of Applied Chemistry, which in this country is largely concerned with bio-chemistry, and afterwards I was made Professor of Bio-Chemistry, and so I undertook all those kinds of problems.

38,397. And in the interim period between your service at Bangalore and your assuming your present responsibilities you were, I think, working on this problem of utilising sewage for agricultural purposes?—That is my hobby, if I may say so.

38,398. What range of enquiries have you been engaged upon? In the first place you have been dealing with the problem of activated sludge?—Yes; I am the representative of that process in this country though for a year I was entirely independent.

38,399. That is a proprietary process, is it not?—Yes.

38,400. Messrs. Adco & Co. are interested?—No.

38,401. What is the commercial concern with which you are concerned?—Messrs. Activated Sludge, Limited, London. I may perhaps just explain, The activated sludge process originated in the laboratories of the Manchester Corporation where I was head of the Sewage Department; we had to find some engineers who would take up the engineering side of it and that was taken up by a firm of engineers and afterwards they held a controlling interest in Messrs. Activated Sludge, Limited. I was interested in the scientific side of the whole thing and under the changed circumstances I became more closely associated with the firm.

38,402. You are still closely associated with it?—Yes.

38,403. Would you care to tell the Commission whether it is your intention to continue your association with Government if possible?—I have an entirely open mind on that matter. If the Government wishes, I am perfectly willing to make such arrangements as they desire.

38,404. Then you have also interested yourself in the problems of making composts from various materials?—That is so.

38,405. On the Adco lines?—Yes. If I may explain, I am in close touch with Mr. Richards whom I have known for a long time. I am trying, just as in the activated sludge process, to apply some principle of activation to the making of composts. That is the essential point I would like to bring before the Commission, the making of composts in a very short time instead of the lengthy period that is now required. I have submitted to the Commission Dr. Rege's paper on the experiments done under my direction at Bangalore; in the laboratory we were able to convert mineral nitrogen into organic nitrogen in 24 hours, and what I am trying to do is to do that on a large scale process. Obviously if we can demineralise nitrogen in 24 hours and make a compost in that short time it will be an economic thing.

38,406. Now, by the system of making composts in a short period, do you produce dry material?—Yes, very nearly dry, because we shall finish the operation by piling it in heaps and letting it heat a little in order to kill all the larvæ and then it is virtually a dry powder.

38,407. Now a question or two about the opportunities for agricultural use of the products of these two processes. Would it be true to say that the product of the activated sludge method is only available for agriculture when it can be carried by pipe or conduit to the fields?—No, because we can carry, as I have explained in my evidence in chief, the night soil as it is at present carried. It is at present carried to the trenching ground where it lies so long and loses half of its value. It can be carried to wherever you want, provided you have got some water; then all the insoluble nitrogenous matter can be separated and dried in the sun or in some other way. That is a problem which is at present being considered; but it can be dried and transported as far as you like.

38,408. I followed your evidence; but I have gathered that if the transport is done in the wet stage the bulk is considerable and so the expense of carrying it is much higher than in the dry compost?—Obviously for a few miles or something like that you can transport it in that condition; but I may say that I am at present devising ways and means; in fact, since I have been here we have had experiments on the subject of drying it absolutely so that it can be sent to any distance.

38,409. So that, if these experiments work out on a large scale basis, both processes would produce a manure which would be capable of being carried by rail or road to any distance?—That is true; the activated sludge would be a more valuable manure and would contain a higher percentage of nitrogen than we are likely to get from the compost method. But still both of them would be transportable to distances.

38,410. Now on the economic side of the problem, have you anything which you could put before the Commission to show the value of these products for the purpose of manure in relation to their weight and bulk? I am thinking of your being able to compete with other forms of fertilisers?—The evidence for that I can give to you broadly. It is mainly derived in this country from the work done at Jamshedpur. I think the Commission has seen the plant there; in the early stages they did a good deal of careful work and they found that the nitrogen in the activated sludge was twice the value of the nitrogen in sulphate of ammonia because of its being in the organic form, and they came to the conclusion that from the point of view of carriage it really had advantages. I think the Commission was given the paper by Messrs. Temple and Sarangdhar in which all those figures are given. In America also some very good results were obtained. With certain crops the effect was extraordinary; they have given two or three times the ordinary yield and that was against all other forms of

nitrogenous manure. But in other cases, for instance carrots, it has no effect; I do not know why. The manure has to be suited for the crop. For instance, it has been shown at Jamshedpur that the effect on sugar cane in this country is marvellous.

38,411. Is it your view, in short, that this manure when prepared ought to compete commercially with other manures on the market and that a municipality should be able, when it is carrying out this process, to cover the expenses incurred by the sale of the product?—I do not say it would cover the whole of the expense. You have got to put down works and you have got to have sewage farms. Then I contend that by putting in the activated sludge plant as part of the scheme you get far better results from your sewage farm, your land does not become sick and the working expenses will be very largely if not entirely, covered by the advantages of the method, by the sale of the sludge and the greater value that you get out of the land.

38,412. You spoke a moment or two ago about experiments in exposing the dried product to the air in heaps by way of encouraging fermentation and destroying parasites?—I was alluding then to the compost, not to the activated sludge.

38,413. I want to ask you with reference to both the processes how far the question of rooting out the substance of parasites has been examined? —A good deal of work has been done, not directly by Messrs. Activated Sludge, Limited, but in connection with a septic tank sludge in Colombo with reference to hookworm, and the results are given in one of the Municipal Annual Reports. They found that if the material was kept for a certain time or heated to a certain temperature it became quite innocuous.

38,414. And the hookworm parasite and other parasites were destroyed? —Yes; that is so. I am at present working it out and I am not in a position to say very much about it. But I believe that, from work that I have done myself and from other directions of enquiry which are going on, it will be possible to dry the activated sludge in thin films at a very low temperature sufficient to kill the parasite without injuring the value of the sludge.

38,415. You agree that is a very important point in this country?— Absolutely; I am very keenly alive to it.

38,416. *Sir Henry Lawrence*: What do you mean by the words "some time"? Do you mean that it has to be kept for a few hours or a few days, or what?—I meant days and even weeks. This was done actually in Colombo. You can obtain the same results without artificial heat.

38,417. *Professor Gangulee*: But the temperature at which the parasitic protozoa might be killed might also affect the bacterial content, the nitrifying organisms?—Yes, that is a point which we considered many years ago, and it is possible to do one of two things, either to dry at a rather lower temperature, taking rather a long time about it, or to dry it at a higher temperature. After all, it takes a good deal of time to sterilize. The higher organisms are more quickly killed than the bacteria. But supposing we find that it is necessary to heat it at a higher temperature, then we can re-inoculate it with a little of the fresh stuff. In fact, I believe a patent was taken out which has now lapsed.

38,418. *The Chairman*: When I asked you just now as to whether the process would pay, I was thinking of course of the process beginning at the point where the normal municipal sewage system ended; so that to that extent it would pay?—Yes.

38,419. I take it that the loss in manurial value going on in India to-day is very great?—It is terrific. I think I have stated in my evidence that there has been a survey made in a great number of towns in the Bombay

Presidency, and the amount that they recover as compared with the actual value of the material is ridiculous.

38,420. That is to say, the value of the material actually available without the need for further sewage systems to collect it?—Yes. I have based all my surveys on the experience of China, where they have had 4,000 years or more of historic experience, and I was called in to advise Shanghai on the water and sewage problems. As a matter of fact, they are putting down very big works there, and in spite of the fact that the Chinese contractors pay the city of Shanghai £40,000 for the nightsoil, in addition to which they provide all the labour for removing it, the process did not seem to be in keeping with the progress of such an up-to-date city as Shanghai. I was, therefore, called in to see what could be done, and they have, as a matter of fact, changed from the one process to the other. The Municipal Chemist says that bulk for bulk there is quite as much nitrogen in activated sludge as in nightsoil.

38,421. I recollect they used to get it in barges? Are the cultivators who remove it to other places using the activated sludge as readily?—Not as quickly, but they are trying to educate them by showing what is done in the parks of Shanghai. But naturally the ordinary cultivator would want to be shown some experiments before he could be persuaded to believe that the one thing was as good as the other.

38,422. In China, quite apart from the sewage which is available in the larger towns, it is of course the case that cultivators throughout the country make use of nightsoil according to traditional methods, by making compost on a small scale?—Yes.

38,423. And if you include those possibilities in India, then the loss on manurial values is colossal?—That is just my point.

38,424. I think you ought to know that the suggestion that you make on page 523, namely, that at Nagpur there are several hundred acres of good land which have been reduced to a morass of sewage weed on which nothing will grow, is warmly repudiated by the authorities responsible at Nagpur. On what do you found your view?—On the information that was given me at Nagpur, and I might say that I visited the place myself. It is not my statement, but the statement of the official in charge.

38,425. Made to you privately?—Yes. But at the same time from my own personal experience I was able to see that the whole place was simply covered by sewage weed.

38,426. What is sewage weed?—I am not sufficient of a botanist to say what it is, but I have had the same experience at Manchester.

38,427. Is it a specific growth?—Yes, it is quite obvious to anybody who is accustomed to sewage treatment.

38,428. Is it a rooted weed?—Yes. I am really sorry if I have said anything which has been resented, but what I have said here is based entirely on what I heard at Nagpur; and Mr. McDougall was with me at the time the statement was made.

38,429. Have you tackled the problem of persuading the cultivator in India to use the products of these various processes?—Not specifically; I wanted to get the products first. I cannot say that I have done very much in that direction. All I can say is that we did some experiments at Nasik at the municipal depôt there, and no difficulty whatever was experienced in disposing of the stuff. There is a lot of grapes growing in that district, and the grape growers there were very keen on getting it.

38,430. How about the caste objections to the use of this class of manure? —My reply to that, so far as I am in a position to reply, is this: In Banga-

lore there is great competition for the ordinary crude sewage for growing the Bangalore vegetables which are sent out as far as Hyderabad (Deccan), and here in the United Provinces we have ever so many sewage farms. The main object now is to do away with the offensive, unpleasant smell where this is dumped, so that I do not see how there can be any logical or any caste prejudices to this system, because after all the people who at present look after the sewage farm will obtain better results.

38,431. Is the dried material, the result of both these processes, offensive?—Absolutely not, and that it what makes me feel so hopeful about the whole thing. In fact it can hardly be recognised for what is originally was. It is really like humus.

38,432. What happens in times of epidemic disease? Is the use of the activated sludge on the land prohibited at such times?—In many cases it is prohibited for vegetables eaten in a raw state. As a matter of fact, no vegetables eaten in a raw state ought to be grown on a sewage farm. In Paris, for instance, that is the law.

38,433. Are any special precautions taken in times of epidemic, for instance if cholera appears in a town, to protect the public from such a thing happening?—I do not think so; at any rate, so far as my experience goes (I am not a Health Officer), I have not heard of a case in which the milk of cows was infected through the cows eating forage.

38,434. I was considering the point from the angle of view of the security of the public funds which it would be necessary to invest in the plant. If every epidemic is to be the occasion for closing down these works for so many months, that surely would be a serious handicap?—Yes; my reply to that would be that there should be a rule forbidding the officials in charge of the plant to grow any but forage crops or things like sugar-cane; in other words, to make it absolutely forbidden to grow any vegetables which are required for human consumption and which would be eaten raw.

38,435. Now then, envisage for a moment the possibilities of extending the use of these manures in their dry state to a distance: Would you put your product on the market?—Yes.

38,436. It would be futile under these conditions to lay down that that manure was not to be used for growing vegetables that were to be eaten uncooked?—No, and for that reason, before you allowed it to go out, you would have to take some precautions just as they have been doing at Colombo, because pathogenic organisms may easily be present.

38,437. You are still making experiments?—Yes. In this country before one has got to the technical process, it is very easy indeed to dry the stuff out in the sun; in fact, that is the method generally used wherever the stuff is transported, and the action of the sun is sufficient to kill all the pathogenic organisms. I have had personal experience with regard to this in an Indian sun during the sultry days of the hot weather. It was in 1909, I think, that I was investigating sewage farms in this Province, and I took some samples at Agra which I found to be absolutely sterile. So that it looks fairly good from the point of view of drying the stuff in the sun.

38,438. *Professor Gangulee*: Have you tried to interest the Agricultural Departments in sewage purification?—Yes.

38,439. Are they conducting any new experiments with regard to biochemical problems associated with sewage farms?—Mr. Anstead down in the South is very keen about the need for organic nitrogen; he gave evidence to that effect. Dr. Norris at Bangalore, since I was there, has carried out some very interesting experiments more particularly in the cultivation of sulphur organisms which will dissolve phosphates, and he has been pursuing

various lines of research in connection with activated sludge entirely independently of me; he is at present writing a report on that.

38,440. The clearance of the effluent from the activated sludge depends on a specific organism, on the clotting enzyme for instance. Ought not the conditions of growth of these organisms to be studied?—A little work has been done already, not so much with regard to that as to the higher organisms present. That was published before the Science Congress, though not in full. There is, of course, an infinity of work to be done; no one realises that better than I do. The interest of the subject lies in the fact that you have in your activated sludge tank, in a concentrated form, exactly what goes on in fertile soil. Sir John Russell agreed with me as to that when I was at Rothamsted last, as did also Mr. Cutler.

38,441. You have studied numbers of sewage farms in this country?—Yes.

38,442. Do you think in India the standard of effluent is up to that recommended by the Royal Commission on Sewage Disposal?—No. I do not say it never is where the sewage is treated, but as it happens, through the courtesy of the Sanitary Engineer of the United Provinces I have full data with regard to sewage farms here, and as far as I can make out they are only treating 10 per cent. of the stuff that comes down to them.

38,443. You referred to land which had been injuriously affected in the Nagpur district. Do you know of any other land in India which has been similarly affected?—At Karachi there is a big and a small farm, both of them good. I saw patches of sewage sickness on the small farm; the other was unaffected. The reason for all modern sewage works, and indeed for the appointment of the Royal Commission on Sewage Disposal, was that the land eventually chokes unless you have a large area of sandy land or carry out sufficient cultivation to get the air into the soil. If you cannot get the air into the soil, things go wrong. I can speak to that from my own personal experience; I have looked after several sewage farms in Manchester and elsewhere.

38,444. *The Chairman*: Is it a colloidal condition?—Yes. You get a colloidal, slimy condition and the water will not go through. I do not say that if one was to plough and plough and plough one could not keep it open, but I have never met a sewage works manager yet who would do the ploughing I wanted him to.

38,445. *Professor Gangulee*: The Adco is a patented process?—Yes.

38,446. You cannot make adaptations of it without infringing the patent rights?—I have gone into this with Mr. Richards and with Messrs. Shaw and Wallace and Co., their agents, and they say I cannot do them any harm but can only help them. There is a chance (I have some evidence of it) that I may be able to accelerate the process; what will happen in that case I do not know, but I should think they will be pleased. I am in constant touch with Mr. Richards.

38,447. Do you use the starter recommended by the Adco process?—No, that is my contribution. They do not work on those lines at all.

38,448. They use some form of nitrate?—Yes, but that is not quite what I mean. They use what they call a starter, which is either ammonium salts or cyanamide. That is a totally different problem, and a very interesting one; I am working on it now. But that is for providing nitrogen.

38,449. You are using a different starter here?—When I speak of a starter, I mean getting the necessary bacteria in. You begin with a heap of refuse, and you add a little night soil to that. It takes a long time before the whole thing gets going, but when you have once got a big heap going and take a part of it to start another heap it gets going at once.

38,450. The activated product you are referring to in your note is not a pure culture of bacteria?—No, there may be fungi.

38,451. Do you think there are many waste materials in this country which could be used as suitable media for making composts?—My experience is that all these small towns have depots with great heaps of straw and so on. The problem I am really keen about is Bombay. We have been asked to get out plans for Bombay, where there is an enormous area to which all the *kutchra* of Bombay is sent.

38,452. Mr. Richards is trying to work with uniform material, but your idea is to work with *kutchra*?—Yes. One wants to know what one is doing, of course, and we have analysed about eight different types of weeds.

38,453. Have you worked out the cost of production of compost manure per unit of nitrogen?—No, I have not got as far as that, because that really depends on how quickly it can be done, and that we have not yet settled. We are in process of finding that out now.

38,454. That is most important?—Obviously. My idea is there is a considerable margin, because with the Nasik process the *kutchra* and night soil has to be left for six months and at the end of that time it gives very little result. There is a considerable margin for a method which costs more but which is completed in a much shorter time.

38,455. You have not gone into the economic aspects of the production of activated sludge or of compost?—We can tell you all about activated sludge. There are so many works all over the world now that we get full records.

38,456. For sludge in its dried state?—No.

38,457. That is what I meant?—That is under discussion at the moment. In America they get a price for it which I believe covers the cost of its preparation.

38,458. *Mr. Calvert*: Could you give us an indication of the extent to which these methods will apply to ordinary village conditions?—Where you have a sewage farm and a Corporation and so on there is no special difficulty other than the ordinary troubles everyone has to encounter. To meet the case of villages I suggest there should be some properly trained officer (a young chemist, for example) corresponding to the sanitary inspector who would be responsible for the villages in a district and see they did their best to make use of such materials as they possessed. I have suggested that a survey should be made of a number of villages to see exactly what they have available. If the thing was properly looked after by the headman of the village and the officer I have suggested, it might be possible to do something. They have always got some cattle that are not working all the time, and which could spend an hour a day stirring the stuff. It would have to be under somebody's control.

38,459. *Mr. Kamat*: Can you tell me whether in villages in India night soil is available in any quantity, having regard to the habits of the people?—Not in the villages, no; I understand your reference. In the case of villages I am thinking principally of cattle urine (now largely wasted) and *kutchra*. I have gone into villages in Mysore and seen paper, straw, &c., blowing about all over the place.

38,460. In the villages the only material would be kutchra; cowdung would not be available?—I mentioned cattle urine, not cowdung.

38,461. The villager wants to utilise cowdung for other purposes?—Yes.

38,462. Both in Nasik and in other towns in Bombay, night soil is converted at present into what is called poudrette?—Yes.

38,463. What is the manurial value of that as compared with the material produced by your process?—There is less nitrogen in it.

38,464. Can you give me the percentage?—The percentage of nitrogen in the case of poudrette is 0·7, whereas we have already got up to 3 per cent. in our experiments here.

38,465. What is the comparative cost of your process, compared with the other?—I am not yet in a position to give that accurately; we have not yet completed our experiments. I have had to work more or less by myself; I had hoped the Bombay Government would do more.

38,466. The poudrette process may be very cheap; you are up against that?—I fully admit that. My point is that a certain amount of extra expense is fully offset by the fact that the product is obtained much more quickly, so that your capital is turned over in a shorter time. If in a month you can get a satisfactory product which contains more nitrogen than the poudrette (which takes six months to make) you have, from *a priori* considerations, a wider margin for any expense which may be involved.

38,467. *Sir Henry Lawrence*: What stage have your negotiations with these towns in Bombay reached? I am not quite clear how far you have gone in the way of putting up schemes to Karachi, Bombay and elsewhere?—There are two things we are discussing; there is the activated sludge process, which has to do with towns with a sewage system, and there is this poudrette or compost-making, which is another problem. Were you alluding to the compost-making?

38,468. In regard to Karachi, I think you yourself mentioned the activated sludge process?—I went there through the courtesy of Mr Measham Lea and he showed me the sewage farm, but I have nothing personally to do with that. I have a number of towns, such as Bombay and smaller places, that we are considering in the way of business. The compost-making is purely in the experimental stage.

38,469. Then I will ask about the activated sludge if that has advanced further. When did you visit Karachi?—Last February.

38,470. Are you in a position to offer any scheme to Karachi for adding on this activated sludge system to their present sewage farm?—Certainly; that is my private business, if I may say so; but at the time Mr. Measham Lea was content with what he had got, and I did not pursue the matter. I understand they are spending money on water and many other things, so I did not press the question.

38,471. What in your opinion would be the cost of introducing your improvements in the Karachi system?—It generally works out at a capital value of something like Rs.6 per head; I have not gone into the data of Karachi especially.

38,472. What is the recurring cost?—The recurring cost, one would hope, would be more than offset by the benefits to the crops.

38,473. But then there would be the initial outlay of Rs.6 per head which would not be recoverable?—Yes, that is my view.

38,474. Then where is the benefit to be obtained?—From the more healthy condition of the soil and the better utilisation of the sewage. At present nothing is being done; of course it costs nothing if you are not doing anything. They are doing that at Karachi, but you must bear in mind that Karachi is a very special place. They have very little rain, and what rain there is comes down in a cyclone sometimes; it is very sandy soil. Therefore if there is any place where you can deal with sewage satisfactorily as raw sewage it is Karachi; but there are many other places where they have not got anything like those facilities. For instance, at Nagpur the soil is an absolutely different proposition; it is that sticky black soil. You cannot take one place and make that the criterion for another place. As I say, I did not press the point at Karachi, though even there there were signs that the land was becoming alkaline; but there are other places where the conditions are entirely different.

38,475. Then do you say that this system would not add to the paying return of the Karachi scheme?—I looked into the matter and I must say

they did very well there; their figures would take some beating, and, as I say, I thought I would let them alone.

38,476. Now take Bombay?—That is another story.

38,477. What benefit would result from your system there?—At present the sewage is not being treated at all; it is going into the harbour and it is a general nuisance. What we want to do, and in fact plans have been got out for it, is to get all the colloidal sludge, the activated sludge from Bombay, and use it for raising crops in the vicinity or for sending away. It would then become a very big affair, and the effluent could be sent into the creek, which is the scheme with which I am most intimately concerned, without offence.

38,478. Have you proposals of that kind at the present time before the Bombay Municipality?—Yes, they have practically been agreed to. As we know, their finances are rather unhappy, but Mr. Watson of Birmingham was called in, his report was accepted and he got my firm to get out plans and estimates. We have gone thoroughly into that. It is just going to begin; it has been passed by the authorities.

38,479. Are you acquainted with the work being done at Poona on the sugarcane farm there by the Irrigation Department?—I have not actually visited it, but I know about it.

38,480. Are they working on much the same lines as you are?—No. I have not actually been there but I have read about it; I understand they use septic tanks; I know a good deal about septic tanks; they are not the most pleasant way of disposing of sewage; they pass the septic tank effluent over the land and dilute it with canal water; in that way they get their oxygen. By the activated sludge process you would get your oxygen in at the beginning by blowing it direct into the tanks, and instead of having sludge of no value and rather objectionable, which is the case with septic tank sludge, you would have a valuable sludge, and you would get as good or better results on the land without the necessity of adding so much water, which the land does not always want. That is my criticism of the Poona work.

38,481. You have got no particular proposals yet prepared for Poona?—No.

38,482. But you think you could do some good if you did prepare a scheme?—Yes, I should think so. If I may say so, I think they are going the wrong way about it to get the oxygen into the soil. They realise they must have oxygen in the soil and they get it by adding a great deal of fresh water; but then the soil does not want all that water; that is the difficulty about all these sewage farms. It is a fundamental difficulty with sewage farms that the land only wants the water at certain times, whereas the sewage comes down all the time. That is the fundamental difficulty which has been the end of practically every sewage farm. Unless it is so big, as at Karachi, and unless the evaporation is so enormous that that factor does not operate, you have that difficulty. Also at Karachi, as I say, you have very, very little rain, but anywhere where there is ordinary rainfall and where there is not a very great deal of evaporation, you have got that fundamental difficulty to contend with. If you can get the liquid portion, the effluent, clean before it goes on to the land, you can put just as much or as little as you like on the land and send the rest away, or better, make it into a pond and grow fish as the Chinaman does, and as they do in Berlin and in many places on the Continent; then you have a clean effluent that will not putrify or become a horrible lake of putrifying sewage, and you can do what you like with the sludge: you can retain it and put it on the farm there and then, or send it away.

38,483. The fish fatten on that, do they?—Yes, certainly; I have seen that with my own eyes.

38,484. *Sir Ganga Ram*: You said just now that you could convert mineral nitrogen into organic nitrogen in 24 hours?—That has been done in the laboratory.

38,485. In what form was the mineral nitrogen?—Sulphate of ammonia.

38,486. But that is already a manure?—Yes, but the point is that a mineral nitrogen will not give the results of organic nitrogen; I think that has been fairly well proved at Rothamsted and also in the Madras Presidency. The problem therefore is to get an organic manure. The production of an organic manure is the reverse of the process of sewage purification. In sewage purification you get organic nitrogen and convert it into nitrates or ammonia. In making organic manure you take the nitrogen or ammonia; our experiments have shown that it goes through nitrates; you reverse the cycle and the nitrogen is made into albumen.

38,487. At present the municipal problem concerns three things: first, the night soil, which is more or less in a solid form; secondly, the sewage, and, of course, the sweepings will go with the night soil; and, thirdly, blood from slaughterhouses?—Yes.

38,488. At present the blood is all exported to Germany; the liquid sewage is simply turned on to the land, and when it is diluted with the irrigation water, of course it does a lot of good. Night soil is also put in the solid shape on the soil. Can you give us a process by which, on a commercial basis, we can utilise all these three things to greater advantage for the land?—That is what I have been trying to explain. You can deal with the sewage by blowing air through it; that is the activated sludge process. The blood, I think, is sold as an ordinary trade product as dried blood, and you can use it as a manure. I have used it in my compound at Nasik.

38,489. Without any mixture?—Without any mixture at all; it is simply ground up in dried powder form.

38,490. Do you not mix it with some lime or something?—No, it is sold as dried blood in a powder or in lumps.

38,491. Can you give us the commercial value of these benefits to the soil? At present the imported fertiliser can be had for Rs.6 per cwt. Will the result of your process be sold at Rs.80 a ton?—Sewage has got to go somewhere; either it goes into the river and fouls the river, or it is used on the farm; but my experience is that unless you have very good conditions, as at Karachi, it never is properly utilised on the farm; most of it goes away; where we do not know.

38,492. In the Punjab it is all diluted with either canal or well irrigation water?—What happens in the monsoon?

38,493. It is all used up. Can you tell us how we can use and get advantage from it over and above the advantage that the Municipality gets?—One would have to go into details because every part of India has its own problem. I cannot say about the Punjab. It may be possible that in your case you could dispose of it; I do not know. I would want to have all the details of the case worked out before absolutely giving an opinion, just as I have been trying to do in the United Provinces where I happen to know something, having been here in 1909. I cannot give you *a priori* what the condition would be; but you have to consider this, that in order to keep your land in good condition you will have to have a great deal of it and you have to put in a great deal of labour. If you do not, sooner or later your land will choke, as it has done in many places. Now at Jamshedpur, for example, they are getting two or three times the yield that they would get with ordinary sewage, and you have to put the value of that against the cost of the new process.

38,494. I want to know what the cost of converting that would be; the rest we can calculate ourselves?—You may take it that for a big city it will cost Rs.6 a head.

38,495. How much per ton?—That I will have to calculate; I cannot say exactly at the moment.

38,496. The second process of disposing of the night soil is practically to burn it?—That is wrong in every way from my point of view.

38,497. Could we make it into some sort of inoffensive thing and offer it in the same form?—Absolutely; I have no doubt about it.

38,498. The third process is practically mixing it with lime and burning it, I suppose?—That is, you are simply destroying it.

38,499. The specimen which you showed me in the laboratory would be too strong, I suppose, if it were given in that state?—No.

38,500. Do you mix it with something else?—No.

38,501. Would it not be too strong?—No; you will have to use it with judgment as you would use every other manure; but you see, after all, ordinary nitrogenous fertilisers contain more nitrogen.

38,502. *Sir Thomas Middleton*: When did the activated sludge process originate in England?—It is difficult to say when a new original idea originates; but we began in 1913.

38,503. Were you not working on activated sludge before that?—No; there was no such thing. I was the head of the Sewage Department of Manchester before that and I think you and I had a certain amount of correspondence.

38,504. I thought your experiments began in 1911?—That is true. They began before that. What we were really trying to do was to solve the problem of utilising cattle urine. If you recollect, that was how the thing started, through my being called in by the Duke of Westminster; he put down a whole lot of wells for cattle urine and with the assistance of a grant from the Agricultural Department we carried out some experiments at Holmes Chapel Agricultural College and we followed them up later in the laboratory. We were also working later on on activated sludge, and the Agricultural Department was interested in that and you have got in the files a number of experiments on the fertilising value of the activated sludge.

38,505. The idea of activated sludge originated with yourself in your own laboratory?—I suppose it did.

38,506. How many towns in England are using the process, the Jones and Attwood plant process?—There are 21 permanent installations in England.

38,507. Do you know whether much of the dried sludge is on the market in England?—Not much in England; but there is some in America.

38,508. What is the practical difficulty of getting it on to the market?—It is very largely a question of the Railway Companies; the carriage is so bad. The cost of it is not more than £3 a ton and however good it may be it seems difficult to get the farmers to have anything to do with manure from nightsoil. There has been a great difficulty in dealing with any kind of sewage manure. When I was in Manchester the year before last, I went into this matter with the manager of the works and he said he had done everything in the way of propaganda and the real cause of the trouble was the Railway Company.

38,509. I should have thought the real cause of trouble was the cost of getting the sludge dried?—That is also true; but even having got the product it seemed difficult to shift it. Frankly, I do not quite understand this question of the disposal of some of these products, because at one

time you find there seems to be a tremendous demand for it. We have been asked to send the stuff to Canada, and on the other hand our next door neighbours would not touch it and it is very difficult to follow the real inside cause of these things. But you are quite right in saying that up to the present there is not a really satisfactory method of drying; but in this country it does not matter very much because you have got the sun.

38,510. That is the point; there is no difficulty of preparing the sludge here, but there is the difficulty in our country of drying it?—Yes. It makes it easier here, and I am at present working in this Institute on quite new methods.

38,511. Do you know how the Shanghai installation dries its sludge? Does it dry artificially?—It dries simply in the sun.

38,512. *Sir Ganga Ram*: Would you mix it with lime?—I am afraid you would then lose some of your ammonia.

38,513. *Sir Thomas Middleton*: Your only difficulty in drying here would be during monsoon months?—That is true.

38,514. Could it be accumulated during monsoon months?—To a very large extent I think so. You could accumulate it and reactivate it.

38,515. With safety to health?—Yes. As I say I still believe there are methods. I am at present investigating quite novel methods for drying it up.

38,516. To come to the other product, the compost, you have explained that saying that your process differs from that of Hutchinson and Richards? —I want to make their process work faster.

38,517. They use the organism in the raw material and feed it artificially? —Yes.

38,518. You put in some further organism?—I allow the organism that they develop to develop still further.

38,519. So that your process involves a fresh starter for each heap?— You make one per cent. of the one and 10 per cent. of the other and start a new one.

38,520. My question is, does that starter keep? Could you transmit it from one place to another?—That is an interesting question which I am not prepared to answer at once; but I say yes. You know it is exceedingly difficult to sterilise material of that sort. It may be done just as we used to do in the very early stages with septic tank sludge.

38,521. But if you are depending on a starter method, you must have some starter which can be readily used?—It only takes a few months to start it and make your starter readily available in the same way as in the activated sludge tank. Having got it once you can go ahead.

38,522. Do you remember the percentage of nitrogen in your dry sludge; what does it vary between?—Between 4 per cent. and 8 per cent.

38,523. What is the sort of variation in your compost?—That is much less, but I have not got sufficient experience to say that; but I think it varies between ·7 and 3 per cent.

38,524. I should have thought that if it were so low a percentage of nitrogen as ·7 it will be difficult to make your process work?—I have got here the analysis made at Poona of the stuff that we made by this process at our Nasik depot.

38,525. What is the class of material in which you have to work in order to get the best result? What amount of material derived from nightsoil is necessary and what amount of material from vegetable sources? —One would say perhaps something like 10 to 1, or something like that.

38,526. Ten vegetable to one of the nightsoil?—Yes, roughly; I am not quite sure.

38,527. *Sir Ganga Ram*: There is an enormous amount of rank grass on the banks of canals? Could that by some process be converted into organic nitrogen?—Yes, it is very excellent stuff indeed; in fact it was with grass that we got the 24 hour result.

38,528. You say in 24 hours it can be converted?—I have not done it except in the laboratory. I say it is scientifically possible, but whether it is so in practice I do not know.

38,529. Could you give me an idea of what the cost would be?—It is simply a question of the available labour I imagine. You have simply got to send a group of coolies out to collect it.

38,530. But after collection what would it cost to convert it into organic nitrogen?—I am not in a position to answer because I have not finished the experiment yet.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Saturday, the 12th February*, 1927.

Saturday, February 12th, 1927.

CAWNPORE.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, KT., C.I.E., M.V.O.
Sir JAMES MACKENNA, KT., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Mr. A. W. PIM, C.S.I., C.I.E., I.C.S.
Raja Sir RAMPAL SINGH } *Co-opted Members.*

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH, } *Joint Secretaries.*

Mr. SAM HIGGINBOTTOM, Principal, Allahabad Agricultural Institute.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (i) The greatest drawback to the present Indian agricultural research programme is that it is inadequate to the needs of India. I doubt if any group of scientists can show much greater results during the same period than those of the Indian Agricultural Service, but there have been too few of them. They have been inadequately financed and have not had sufficient trained assistants nor sufficient official encouragement to do the work India needs to be done.

There is need for Pusa, where certain problems for the whole of India can be worked out. But Pusa is hard to get to; not all the problems for the whole of India can be worked out there. In addition to Pusa, there should be other properly equipped and staffed research institutions, not necessarily provincial but located with respect to the factors of soil, climate, altitude, rainfall, etc. To develop provincial *esprit de corps* and loyalty it might be well to have such institutions under the Provincial Government in whose areas they are located. Pay and prospects in these provincial institutions should be equal to those of the Imperial Research officers if their work is up to standard. At present a Pusa appointment is a plum which frequently attracts a man well prepared to continue in his provincial appointment, where he has served his apprenticeship, and is ready, if left alone, to make a real contribution to the betterment of local agriculture.

There should be the closest co-operation between the Imperial and the Provincial Research Departments. The Imperial should be able to act as a liaison office and might suggest to the different provincial institutions problems of local or provincial interest as well as problems relating to the interests to India as a whole.

(ii) *Veterinary Research.*—The Veterinary Department should have charge of all study of animal diseases, including their prevention and cure. The present staff of the Veterinary Department is pitifully small and should be very greatly enlarged. A great many valuable animals now die each year because they are beyond the reach of any veterinary assistance whatsoever.

A course of lectures by a veterinary officer should also be given in every agricultural college, not with the idea of making every agricultural graduate a veterinarian, but to enable the student farmer to tell whether the ailment is simple, like a gall or bruise, or whether it is serious and needs the treatment of a qualified veterinarian.

I do not favour the veterinarians having charge of animal breeding in India. What the Veterinary Department has done in the past does not suggest that they have the idea of the production or breeding of an animal with certain economic values. I believe the animal-husbandry man knows the kind of animal he wants and he can be trusted to breed it. But when his animals are sick he then needs the veterinarian. The veterinarian has enough to do to prevent disease and to cure it to keep him busy for a long time to come in India.

1. (*c*)—I would suggest the following for further study and research. In some of them a little is being done, but much more ought to be done and that speedily. More men should be turned loose on these problems so that, as a result of their pooled experience, we might get some definite information and ascertain new and successful methods.

(1) The problem of the necessity and value of tile drainage.

(2) Methods of utilising:—

(*a*) The man power of the village when not engaged in agriculture.

(*b*) The use of animal power when not engaged in agricultural operations.

One of the largest contributing causes to India's poverty is the enforced idleness of both man and beast in so much of agricultural India to-day. Both man and animal suffer because they are paid for what they do, and they do not do enough to earn a living wage. In certain parts of India because labour is so cheap, and men are unoccupied or not profitably occupied for so much of the time, there is no demand for a village power unit for grinding grain and cutting fodder and sawing wood and pumping.

(3) Inprovement of wells. A great deal of India is beyond the reach of flow irrigation and can only be irrigated by means of wells. We know to-day very little about enlarging the capacity of wells. We have not yet discovered an economical fool-proof pumping unit that is within the financial and mechanical reach of the village farmer. Well water is expensive to raise, and the area commanded by one well is usually small. It is worth the life-time efforts of a number of very good engineers to work out the most economical power units and most economical use of well water and the most profitable crops to grow under well water. There are over 6,000,000 wells in India, a very large majority of which could be of better service than they are if the problems were thoroughly studied.

4. Prevention of erosion. Another subject which requires investigation is the prevention of erosion. The annual loss to India through the washing from the sun-baked land of the loose, dried manure and organic matter and surface soil is perhaps the greatest economic loss from which India suffers. This fertility which India needs frequently goes unhindered to the sea.

5. Contour irrigation. At present most of the irrigation of India is done on levelled land. To terrace land is very frequently so expensive that after the ground has been terraced or levelled no crops can be grown upon it that will pay interest charges on the investment. There is, therefore, needed a number of officers skilled in contour irrigation methods whose work would be to bring millions of acres not now irrigated under command. Along with the prevention of erosion goes the advisability of putting in small *bunds* or dams which frequently reclaim only a few acres. But these small dams can reclaim an aggregate of millions of acres, and, in some districts of India, would mean all the difference between economic success and economic failure.

6. Fertilisers. Another problem for investigation is the use of commercial fertilisers for the different soils and climates and the proper use of village waste.

7. Damage from wild animals. Another subject for investigation is the damage caused by wild animals, the causes that underlie much of this, and the remedies, if any, to be applied. I have been looking into the damage caused by wild animals and I am greatly disturbed by what I find. I have discussed this with a number of qualified observers, and they put the average loss of grain crops and fodder crops from 10 to 20 per cent. of the total yield of India. In many parts commercial orcharding is almost impossible, due to the depredations of monkeys, flying foxes, porcupines, jackals, squirrels, rats, wild-pig, deer, wandering cattle, green parrots, wild pigeon, peacock and other grain eating birds. It is not only that these animals between them destroy anywhere from 10 to 20 per cent. of the cultivated crops of India, but for fear of their depredations many farmers do not grow crops which would be more profitable than the crops they do grow. For instance, while India has three-fifths of the world's sugarcane acreage, it grows two-fifths of the world's sugarcane. It imports anywhere from half a million to a million tons of sugar. While the Government sugarcane breeder has produced canes for India the equal of any cane on earth, the spread of these good canes is very slow, because they are not so tough and woody and fibrous as are some of the indigenous canes. They are therefore a greater prey to wild animals. If India grew the best canes, she could not only meet all her own sugar requirements but would have a surplus. In a country predominantly vegetarian, sugar as a source of energy in the diet is relatively of greater importance than in other countries. The *per capita* consumption of sugar in India is only one-fifth that of the United States and Canada.

I have evidence from an estate of 1,300 acres, of which 300 acres are cultivated, that 20 watchers, men and boys, are on the pay roll all the time, employed to drive away the monkeys, of which it is estimated they are over 2,000 on the estate. In spite of the 20 men and boys employed, the monkeys destroy at least 50 per cent. of all the vegetables grown and 20 per cent. of the field crops. Before the monkeys came in there, an orchard was sold for Rs.500 or Rs.600 a year. It now sells for Rs.30. Owing to the religious belief of many of the people of India, it is difficult to discuss this problem without appearing to wound their religious susceptibilities. Greater than any other cause of India's poverty is the doctrine of transmigration or reincarnation. The economic aspect of the doctrine of transmigration needs to be studied, because in the midst of a dense population a belief in it keeps alive a great many animals that enter into direct competition with man for the produce of the soil. The average annual economic loss entailed is much greater than the Imperial Government and Provincial Governments receive from all sources to run the country. Regarding the cattle, regarding the surplus wild animals, an outsider can do little. If there is any improvement it must come from within the fold of Hinduism, and I often wonder what would happen if the Hindu scholars would search their scriptures. Could they not find some way out of the present serious position?

QUESTION 2.—AGRICULTURAL EDUCATION.—I thoroughly believe in some form of agricultural education for the village boy, who, as soon as he is old enough, begins to learn the methods pursued by his father. If every village school were in charge of a properly qualified teacher, better methods, and better seed and the economic use of manure could be introduced. I know a great many educationalists do not believe in agricultural education in the schools. The schools in which agriculture is taught in the Philippine Islands, in the schools of Canada, and the schools in some of the southern states of America have revolutionised rural life. It has been through the village agricultural schools following scientific methods that the adults have

been won to better methods and more profitable systems of farming. The great difficulty with most education given in Indian rural schools is that it has been prepared for the city boy. It is just as easy to teach arithmetic and mensuration by means of figures taken from agricultural life as it is by figures taken from city life. The problem is difficult, but to leave it alone is to confess failure. To quote General Armstrong, the founder of Hampton Institute, I know of "no rural disability for which ignorance is the cure." This being true, it may be that we have not yet devised the right kind of education for the Indian village. The magnitude of the problem, the ignorance and inertness and hopelessness of the mass are frequently used as an argument against village education; whereas these facts are the greatest argument for it.

If to-day there were unlimited funds for rural education in India, little progress could be made because first, there is no definite well-thought out programme of rural education, and secondly, if there were a programme, there are very few teachers who have had the training which would enable them to carry out the programme. So the first need is a programme for rural education suited to rural life, and secondly, a supply of properly trained teachers.

Almost all forms of agricultural education in India suffer because those in charge of it are trying to look both ways. They say they want to turn out a practical farmer, but they insist upon so much science and laboratory work that there is little time for the student to learn how to do things successfully on the farm. The result has been that far too many of those passing through the agricultural colleges of India have become Sub-Deputy Assistants to some officer engaged in laboratory investigation. There is a most important place for laboratory work and study, but we must frankly give to the village farmer training that will enable him to produce larger yields at a smaller cost of production per unit. This can be done.

(i) The supply of teachers for rural schools is not sufficient. There is urgent need for extension of agricultural teaching facilities in the Allahabad District.

(ii) A few years ago the Collector of Allahabad, Mr. S. H. (now Sir Selwyn) Fremantle, provided each one of the 62 village schools with a plot of ground and a well, and sent teachers and deputed village teachers for agricultural training. These teachers then went to the village schools and in some of them very decided progress was made. But there arose Collectors that knew not the ideas or ideals of Sir Selwyn Fremantle, and so the village teachers ceased to function as teachers of agriculture. The school gardens and equipment were destroyed; in some cases the land has been rented to a local farmer, but the land still belongs to the schools and, if there were trained teachers to put in, I believe there is no district in the whole of India better situated for worth-while experiment in rural education than the Allahabad district.

(iii) As far as possible, teachers in rural areas should be drawn from the agricultural classes; but very few of the agricultural classes, that is, actual farmers, are sufficiently educated or have the desire to become teachers. The landlords and other rural non-manual-labour classes usually become the teachers in village schools, and while they live in small villages their ignorance of agricultural matters is frequently profound, many-sided, and almost unbelievable. Many are proud of their ignorance. It is amazing to talk to men who have lived in the village and find out how little they know of what goes on under their noses; truly "having eyes they see not"

(iv) I do not consider the attendance at existing institutions is as numerous as it should be. One reason for this is that agricultural education is new; then there has not been a sufficient number of jobs in Government service; again, agricultural education in a number of instances has been cheapened because qualifications for admission have been easy and

so have attracted students who could hardly have entered an ordinary arts or science institution. Apart from Government service, there is little demand for trained agriculturists. The large land owners and zamindars for various reasons have not seen fit to employ graduates of agricultural institutions, or if they have employed them have insisted on their following old methods; or they have too much impatience and expect the graduate of the agricultural college to be a miracle worker who can produce results in one season in India that would take years of patient efforts in any other country. Or they have failed to recognise that improved agriculture is an investment, money must be put in, and time must be given to get an adequate return.

If some system of district demonstrators or farm agents or advisers could be introduced in India, or more extensively used than at present, such demonstrators, going to the actual farmer, knowing village conditions, and teaching the farmer on his own farm with the resources that he has, and the means at his disposal, how to produce bigger and better crops more economically, would soon create a demand for more instruction. Much greater use would be made of Government Military Dairy Farms as educational institutions. Apprentices could be taken for training in them.

(v) The main incentive which induces lads to study agriculture is in a majority of cases the hope of a Government job; to work for a large land owner; to actually get their living as farmers on the soil; and lastly, a desire to do good to their country through improved agricultural methods.

(vi) My observation is that a majority of pupils who come to agricultural colleges are not drawn from the actual farm classes but are from the landlord or professional classes.

(vii) The modification in the existing courses of study which appear to be called for are to make them less technical and scientific and more practical. In most cases to-day assent is given to this idea, but in actual practice agricultural students spend much more time in class work and laboratory than they do in the field. Furthermore, the courses should be for not less than four years in the case of an agricultural college leading to a degree. It is impossible in the present intermediate course to turn out a trained farmer. In the village schools every year the student should do some practical work in his plot in the school garden.

(viii) My views upon nature study are that, while it can be a most useful adjunct to a school, it is frequently of very little use.

I believe the individual plot, say, one metre by three metres, where each pupil does his work under the direction of a qualified teacher is a good thing for the village school.

I do not think every village school should have a school farm, but there should be in every district a centralised school with a farm to which the best of the boys should go at the age of about 14 and stay until they are ready to enter college or go to work to earn their living. These school farms, if they were used as educative factors, would not be likely to be financially self-supporting

(ix) I append a brief account of the students who have undertaken a two or four year course of agriculture since 1912 in the Allahabad Agricultural Institute. You will see that a majority of the men are engaged in something connected with the teaching or carrying on of agricultural operations.*

(x) (1) By having a good school well equipped and well staffed, with a normal social life which includes games and literary societies. These men should be so trained that they can go out and manage land and farm for profit, or go out as farm demonstrators or agricultural advisers. Few men are fit for this who are not able to make a success of farming. Rural education in rural tracts can be popularised if it can be proved that it pays financially.

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* *Vide* Appendix I.

My experience is that many farmers know much better than they do. They do not do their best because of the illegal exactions by either the landlord or his agents or by the petty officials or their families. Rural education can be improved and popularised if it can be shown that the actual farmer will reap a fair share of the return to his labour and be secure in his holding. I have known farmers grow Pusa wheat for one year only, or better sugar-cane or better cotton, and refuse it the next year because they said that those in whose control they were, reaped all the reward, and they were left with only enough to keep body and soul together.

(2) Back of and beyond all other problems of rural India is the problem of giving security and certainty to the village farmer. No legislation, no orders-in-council are of much use in this connection unless there is the heartiest co-operation and mutual trust between the Indian landlord, the Indian moneylender and the Indian official who comes into direct contact with the farmer in the village. They need to learn that their interests are common and not mutually exclusive. The increase in production, if all worked together, would give each a large share and thus each would be better off.

(xi) I suggest for better educational facilities in rural areas that every rural school have its garden plots in which a majority of the pupils can have their own individual plots. This school plot to be in charge of a trained agricultural teacher and this school to be supervised by a trained agricultural Supervisor and be inspected by an Inspector with a knowledge and appreciation of agricultural conditions. The present financial allotment is insufficient for this kind of education.

(xiii) There would have to be increased taxation or at least a local cess to provide money. But after this system had got going it would prove itself to the country side, and they would gladly support it. The difficulty is to start.

So far, I have written under the head of agricultural education and taken it to be synonymous with rural education, but I have thought only in terms of boys and men and of improving their lot. Reflection shows, and experience in India demonstrates that, as long as the education meets only the needs of half the population, that the whole population is held back by the ignorance of the half that fails to be educated. While the problems concerning boys' and men's education in rural India are staggering and bewildering, the problems of the right education for the girls and women of rural India are much greater and much more difficult of solution than for the boys and men. I believe that in connection with every agricultural college and centralised school there should be a women's department with women teachers who would teach domestic science which would, of course, begin with the home, its betterment, the care of children, the proper preparation of foods, the sanitation of the home. Quarters where married students could bring their wives are necessary. As long as the girls and women of rural India are satisfied with the homes in which they now live there is little hope for any improvement in rural India. But if these girls and women were trained they would make greater demands on their husbands and fathers and brothers for a higher standard of living in the home. The trained girls and women would provide the incentive, and also would be the spur to urge on the men to increase production and increase profits. So that, unless the Royal Commission on Agriculture takes thought concerning the home of the farmer and suggests means for its betterment, its work will fail to get the largest results.

The education of the village girl and woman is fundamental in any scheme of rural betterment for India. It is only by educating women and girls that the standard of living can be raised.

QUESTION 3.—ADMINISTRATION AND PROPAGANDA.—I believe, regarding administration and propaganda, that the Rockefeller Foundation Education

Report for 1914 shows the way to get into touch with the cultivator. A Country Agent or trained farm adviser going to the farmer where the farmer lives, gets him on his own land and by his own efforts to carry out suggestions, is the most effective way to spread the knowledge of better agriculture to adults. Frequently in India the wishes of Government have been defeated through having men in actual contact with the villager who have had more concern for their own immediate financial success than they had had for spreading the better seed or better methods which the Government is anxious to propagate. We have in the co-operative movement, not only for co-operative credit but also for co-operative buying of tools and fertilisers, the co-operative storing of fodder and grains and marketing of farm products, the greatest hand-maid to agricultural betterment known to men. But it must be worked with honesty and intelligence and business sense.

QUESTION 4.—ADMINISTRATION.—(c) (i) The Agricultural and Veterinary Services. I am not satisfied with these services, because I am repeatedly written to by people who want advice on the growing of certain crops, or the control of certain pests, or regarding the suitability of a given locality for the production of a certain crop, and when I have referred these people to the local agricultural authorities, the writers frequently have told me that they got unsatisfactory answers. The Agricultural Department is not wholly to blame for this; the men in it are already so loaded that it is physically impossible for them to attend to the calls made upon them for advice. The agricultural literature costs too much. The price should be nominal, or be given free upon request.

There should be an Extension Officer in connection with every agricultural department, and under him should be a properly qualified adviser in each of the different branches who could not only send a printed statement regarding the crop of plant, pest or disease in question, but could either himself visit, or depute some qualified officer, to go to the place and see and advise on the spot whenever it is necessary.

(ii) The railroads of India are of the greatest importance to agriculture They are now covering most of the country with main lines. I have not recently had experience of the railroads, but some few years ago I had a good deal, indirectly, and found that it was almost impossible to get wagons for the despatch of goods in time, and then only upon the payment by the prospective shipper of an illegal gratification to the station staff. This greatly interferes with the mobility of the crops and adds greatly to their cost of production. The pilfering on the railway and the failure to secure compensation also add greatly to the worries and anxieties of the shipper. It was almost impossible to send some consignments of fruits and *ghi* and certain agricultural products without having the parcels opened. I have also watched in stations railway servants handling consignments of fruits and vegetables so roughly as to break open the containers. The containers were so constructed as to satisfy any ordinary demands, but they were purposely flung about so as to burst them open, and the railway servants then helped themselves as to what fell out.

The carriage of cattle is very expensive and unsatisfactory. There is no provision for shipping one animal. One frequently wants to get a bull, but the freight charges make it impossible, and thus retard the improvement of cattle in India. Loading stations are improperly equipped. In the grain exporting districts oftentimes the goods warehouses and platforms are insufficient in number and size, so that frequently grain has to be stored on the open platform at owners' risk. If rained upon, there is the germination of seed and consequent loss. I believe there should be special cheap rates on the railroads for the transport of commercial fertilisers. These, properly used, would lead to a great increase in a crop yield with consequent increase of railroad transport of the crop. Why should it cost twice as much to ship a goat in a dog-box as a dog in the same dog-box in guard's van?

(iii) *Roads.*—There are few subjects of greater importance to the farmer in India than the increase in number and improvement of roads. Some of the potentially richest agricultural districts of India are the poorest economically because of the lack of roads. In a good many places it is only during the dry season that carts can be used. During the rains the only way to transport is by head-load. There is a limit to the economic distance that a head-load can be transported. I believe that the Government of India ought to enter upon a programme to provide a system of *pucca* roads as feeders to the railroads and have motor transport as feeders to the railroads. A system of good *pucca* roads with proper bridges would make it easy for any rural community to sell its products when the market was most favourable. To-day it often is compelled to sell its products only when the roads are open if there are any roads. I know of a good many villages within reach of Allahabad markets where, because there are no roads, the cost of transporting by head-load or pack-animals is so great compared to that of ox-carts that the villagers, instead of reaping the reward of the fertility of the soil, are very poorly off. Market price pays no premium on head-loads or makes allowance for expensiveness of transport. This is always borne by the grower.

(iv) *Meteorological Department.*—I believe the Meteorological Department of India can be of much greater service than it is at present. To-day it might be of great use to the Indian farmer. I do not know upon what basis its present reports are given out or how they are designed. I am given to understand that temperatures are taken 10 feet above the ground, and so Allahabad officially has never had a killing frost. Its lowest official temperature is 40° F. (December 25th, 26th, 27th and 28th, 1926, had killing frosts on our farm.) My tomatoes and *arhar* and *chana* and other crops that are killed by frosts do not grow 10 feet above the ground and know nothing of the official temperature. They are grown upon the ground, where every second or third year we have a frost which does very material damage. The Meteorological Department is in a position (possessing information which it could give to me and other farmers sufficiently far in advance) to advise so that we could take measures to prevent the frost doing us serious damage. Upon the warning from the Meteorological Department that a killing frost was imminent we could irrigate or light smudge fires or get large wind-sails with a suction fan at the bottom and pull down the warmer air from the upper layers to mix with the cold air in the orchards or gardens. Further, no sun temperatures are given, but most crops grow out in direct sunlight.

Again, the yield of so many crops in a district depends upon the amount of rainfall during a given period of time; crop forecasts by the Meteorological Department are often more reliable and correct than those of the Agricultural Department, which bases its reports upon the acreage sown, whereas the Meteorological Department gives the climatic conditions during the critical periods of growth. By using a series of coloured signal flags at railway stations, country post offices and telegraph offices, at police outposts, a system of warnings could be offered to the agriculturist which would be of great economic value to him. The worst killing frost of modern times in the United Provinces occurred during the first week of February, 1906 or 1907? Field crops were far enough along in flower or bud or fruit to be ruined by the frost. Had the Meteorological Department had its system working and the people conversant with it, a saving could have been effected that would have kept the Meteorological Department going for many a decade. I lay great importance, therefore, upon the improvement of the meteorological service to the farmers of India.

At present we do not get weather "forecasts." When we get weather forecasts, usually we have already experienced the weather the official forecasts tell about through the press.

(v) and (vi) *Post and Telegraphs.*—India is admirably suited to what is known in Canada and the United States as the "Night Letter System." According to this, a letter of 50 words handed in to any telegraph office between 6 o'clock at night and midnight will be sent by wire and mailed the next morning in the first mail delivered. This 50-word night-letter goes for the price of an ordinary day telegram. The distances in India are such that if the system were in vogue merchants in Bombay and Calcutta could interchange ideas very much more quickly than they can by using the ordinary post. Furthermore, this keeps telegraphs working at a time when otherwise they would be little used and reduces overhead charges. It makes a great deal of work for telegraph operators, and has been proved a great boon to the public and a source of increased profit to the companies that own the telegraphs. Furthermore, wherever a person receiving a telegraphic message is a telephone subscriber, there is such close co-operation between telephone and telegraph departments that the telegraphic message is immediately telephoned out to the telephone subscriber, and is later on sent by mail from the telegraph office. This saves time in getting the message to the recipient, and also saves on messengers when a telephone call is cheaper than a messenger.

QUESTION 5.—FINANCE.—My view concerning the steps to be taken for the better financing for agricultural operations is to prove to the three parties concerned, namely: Government, the landlord and the cultivator, that in the long run and over a period of years their interests are identical rather than mutually antagonistic, and to convince all of them that the improvement of agriculture is an investment. This calls for the education of the three classes concerned. The quickest way to secure adequate finance is to first improve the lot of the farmer. If he is prosperous and has money to spend, landlord and Government will get a share, but if the farmer has little or nothing there is not much for the other partners.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—In my opinion the main causes of borrowing are: bad seasons, fall in prices of agricultural produce, illness which prevents the proper preparation of the seed bed or harvesting at the right time, social functions like weddings, oppression and illegal exaction by money-lender, landlord and petty officials. Few farmers keep accounts of the various operations performed, so that they have no correct information as to whether the thing that they are doing gives an adequate return or no. A great many of the operations performed, like the feeding of inefficient cattle or the growing of crops that do not pay, is really a consumption of their capital, but because they keep no accounts they cannot tell where their loss is.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—Mr. Calvert and those with him in the Punjab have done the most successful work in India in reducing the loss in agricultural efficiency due to fragmentation of holdings. I believe that sufficient has been learned in the Punjab about this that legislation could well be enacted to enable a majority in any given district who desired to consolidate their holdings. There would need be adequate safeguards, and those in charge of carrying out the reallotment would need be very sympathetic and full of knowledge. The legalist and martinet type of officer would not do for this job, but a man of insight and understanding is called for.

QUESTION 8.—IRRIGATION.—(*a*) I have travelled over a considerable part of Central India, Central Provinces and Rajputana, as well as the United Provinces, the Punjab, Kashmir and Bengal. Central India and Central Provinces, with their long narrow valleys, through a series of dams, lend themselves to successful water storage. A great many of the irrigation schemes that could be put in would be "protective" rather than "productive." The late Maharaja of Gwalior did a great deal in the way of

irrigation through the advice of Sir Sidney Preston. A great many tracts that are now very precarious and uncertain could be very profitably protected. I do not believe that sufficient importance has been paid to the possibility of a great many small irrigation units in the form of a dam that collects water from only a small catchment area. There is great scope for the introduction of small irrigation schemes, many of which could also provide a limited amount of electrical power. There are also possibilities for much larger schemes which have not been brought into effect because the power and storage site might be in one territory and the land to be benefited in another. Some form of co-operation should be worked out so that these things could be made profitable to all concerned. I have already mentioned wells in my note under research.

(*b*) I am not satisfied with the existing method of distributing canal water to cultivators. I believe that all water should be distributed by measure. This would induce the cultivator to use more economical means, and thus would greatly increase the duty of irrigation water. In a great many places where the water is given at stated intervals without measure, the ground to be irrigated is flooded; frequently to the detriment to the yield and certainly with great wastage of water. Furrow irrigation with inter-culture is more economical than the flooding method. It is customary to have very small plots of land which are flooded. The water is rushed on in a short time and then left. This takes a great deal of labour and great loss of water by evaporation. Long furrows up to 500 feet in length with a small amount of water trickling down eight or ten furrows at a time, rather than the same amount of water rushed down in one furrow, will greatly increase the duty of water. After irrigation, as soon as the furrow is sufficiently dry to cultivate, a single bullock cultivator will then conserve the moisture. In this way 20 per cent. to 50 per cent. of the water and 10 per cent. to 25 per cent. of the labour will give a better crop than where flooding is practised.

QUESTION 9.—SOILS.—Research work upon the soils of India has been done in limited measure. We have a very great variety of soils and very seldom do two different types respond in the same way to similar treatment. Soil study is one of the fundamental problems to be dealt with. This is a sphere where Pusa and the Provincial departments should have a strong staff working in co-operation. These soil specialists would study trenching, reclamation of *usar* lands and the prevention of erosion.

(ii) I know of very marked improvement of the land of the Agricultural Institute. When we took it over in 1912, all except a little on the river bank was very badly infested with *kans* and *kus* grass, some of it had not been ploughed within the memory of man. It was very badly eroded with deep gullies. The first thing we did was to put dams at certain strategic points so that whatever silt-laden water came down was immediately deadened in its flow. The carrying power of water varies, as to the sixth power of its velocity, so that any reduction in velocity must cause very considerable deposit. In three years in one place there was a deposit of alluvium 10 to 14 feet deep. One dam cost Rs.1000—the area reclaimed is about 50 acres. This land which formerly could not be rented at more than four annas a bigha or six annas an acre is now producing crops 25 to 30 maunds of Pusa wheat per acre. It grows crops of sorghum fodder running about 17 to 18 feet high and yield 20 to 25 tons of green fodder per acre. Where this land is not actually submerged two crops can be grown in one year without irrigation. Our village neighbours have estimated that every year on the land reclaimed by this dam, that formerly produced very little of economic value, there is now produced grain in value five to ten times the cost of the dam. The stalks and straw they do not count. But they say these as fodder more than pay the cost of production of the grain. A number of villagers have come and asked us to help

them to put in similar dams saying that those benefited will pay in proportion to the land reclaimed. Only the financial stringency and inadequacy of our staff have prevented us from taking advantage of these invitations to co-operate with our neighbours. I know of large tracts that have suffered severe deterioration because no dam has been put in, and all the trees and shrubs and grass have been taken away so that erosion has gone on without let or hindrance.

QUESTION 10.—FERTILIZERS.—Much greater use could be made of natural fertilizers than is now done. Common cattle manure will yield a much greater profit when put on the soil and ploughed in than when turned into cakes and burnt as fuel. In and about Allahabad the custom is for a contractor to pay the *gowala* anywhere from one rupee to two rupees per month per animal for the right to take the manure and turn it into cakes for fuel. The urine is almost invariably wholly wasted, that is where there is no bedding used to soak it up and then send it to the field as manure. If the animals stand on dirt floor the dirt is not taken out and used as manure and replaced by fresh dirt. A cow or a buffalo in full milk weighing from 900 to 1500 lbs. will make from 60 to 100 lbs. of manure per day. Seventy-five per cent. of the chemicals in the food will appear in the manure, that is, the chemical ingredients which are usually bought as commercial fertilisers, nitrogen, potash and phosphorus, if these are returned to the soil there will be great increase in fertility, to say nothing of the organic matter which is so valuable for improving the soil, increasing its friability and water-holding capacity. The manure the *gowala* sells for Rs.1 to Rs.2 on chemical analysis is worth anywhere from Rs.5 to Rs.8 per month, and would pay a farmer to put it on land at that price. There is a great waste of other animal manures due to caste and various religious and social prejudices. In the matter of the utilisation of the home-made manures, India is the most extravagant country on the face of the earth. This is one reason why she is one of the poorest. The failure to utilise the bone, most of which is exported, the burning of the of the cowdung, the unwillingness to use other animal manures, unless on the part of low caste people, because higher caste people could not touch it, causes a loss of fertility that is very great. India wastes what could make it rich if properly used, and what does make other countries, much less favourably situated agriculturally rich. On the Agricultural Institute land we follow the system of trenching where all manure, stable-litter, weeds that the cattle will not eat, waste paper and all organic matter of any kind are trenched. I append a bulletin showing the system followed. After twenty years I am convinced that for the conditions round about Allahabad this is the most economical use of manure. When I speak to the Indian villager about using his cattle manure as fuel, he says it is bad but he has no other fuel. If the people of India were not so prone to destroy, ruthlessly, young trees that have been planted out, there is enough waste land or land along paths or road-sides where quick growing trees could be planted so that almost every village could have an abundant supply of wood for fuel. This is where co-operation has a chance to prove its value. Again, if the village farmer would put his cowdung on the land he would increase the crop. He could sell the surplus and with the proceeds therefrom buy himself a good blanket or quilt or bedding. He would not need so much fuel to keep warm. The poor village people of India keep themselves warm through the cold weather, not through having an adequate supply of clothing, but through burning cowdung, leaves, twigs and grass and stubble, all of which would return much more if put into the soil.

Then too, large districts of India can be taught to use coal as fuel if there could be on the market a cheap, economical, coal-burning stove or grate adapted to the Indian village and not to the European kitchen.

QUESTION 15.—VETERINARY.—I believe the Civil Veterinary Department should be separate. It should care for sick animals, should seek to prevent disease among animals and should strive to educate the village farmer as to when a veterinarian is necessary. The Civil Veterinary Department, however, should not be engaged in the commercial breeding of animals. This, I think, can be best done by trained breeders, whether it be of cattle or horses or sheep or chickens. The professional breeder has an ideal type in mind that he is breeding towards. It is not the Veterinary Departments outside of India that have given us the best animals. It is the trained and skilled breeder who has had a definite object in view. The viewpoint of the veterinarian is usually to get an animal largely immune to disease, that can fend for itself. Whereas by the very process of domestication of animals there are developed in them those factors that best serve mankind, and, in so doing rob them of much that they had to protect themselves within a state of nature.

QUESTION 16.—ANIMAL HUSBANDRY.—*Dairy Problem.* The cattle problem of India is extremely complex. On the one side you get men saying that the present high prices of cattle and dairy products are due to an insufficient number of cattle in India; that the slaughter of cattle and the export of cattle impoverishes India. On the other side, you get those who say that India has far too many cattle, either for the food supplies, or the economic needs of the country. The importance of this question to India is so great that Government would be wise to put on a strong committee to tour the country and learn the facts at first hand. This committee should have representatives of all shades of opinion, and its instructions might include the study of the economic aspects of the cattle problem. The fact that the cow is held in veneration by a large majority of the people of India makes it extremely difficult to study this question on its merits. Frequently, one is accused of deliberately wounding the religious susceptibilities when discussing the cattle problem in its economic relationship. It ought to be made clear that there is no desire on the part of anyone to wound anybody's feelings with regard to his religious beliefs.

I saw some figures not long ago written by a man who was comparing the number of cattle in India with other countries in *The Indian Social Reformer* of 12th June, 1926 (page 640). The figures given are the number of cattle per 100 of population:

In India	59
Denmark	74
In the United States	79
In Canada	80
In Cape Colony	120
In New Zealand	150
In Austria	259
In the Argentine Republic	323
In Uruguay	500

Assuming these figures are correct, without analysis they are apt to be misleading. In the first place, in most of the countries outside of India the cattle are divided into two classes, milk cattle and beef cattle. In the case of the dairy breeds almost all the females that have good conformation and good constitution are kept, but any that are faulty are ruthlessly destroyed. In the case of the males, only the bull calves from the best cows are kept alive for breeding purposes; the rest are used for human food as veal. In the case of Denmark and New Zealand, which are pre-eminently countries that have gone in strongly for dairying, and they are therefore very prosperous countries, a good dairy cow produces more profit per year on the average than any other bovine form. They strive to increase the production of milk and butter per individual cow rather than increase the number of

cattle. It costs less to produce 10,000 lbs. of milk from one cow than to produce 10,000 lbs. of milk from five cows. High producing cows produce cheap milk. Low producing cows produce dear milk. That is why milk is so dear in India. In the west of the United States, in most of Canada, in Cape Colony, in the Argentine and Uruguay, the greater emphasis is on the beef breeds where cattle are bred, especially for the meat they will produce. The recent phenomenal prosperity of the Argentine and Uruguay are due to the fact that their exports of greatest value are ship loads of chilled beef sent to Europe. Also breeders from these countries go to the British cattle sales and pay thousands of pounds per head for the best bulls of the beef breeds to improve the beef in their own countries. It would be found upon analysis that a large majority of the cattle in the beef countries are under two years of age. The only ones over that age are the breeding cows and bulls. The fashion for beef to-day in beef-eating countries is for well-fed beef animals from 10 to 18 months of age. They call it " baby beef." It is much more profitable for the breeder than to keep cattle for three or four years. An analysis of the figures for the cattle of India would reveal the fact that a very large number of cattle, I should say from 10 to 15 per cent. of the cattle population of India, consists of old cows and bullocks too old to work or breed, barren heifers and cows, and deformed and useless animals for either milk or draft. In any other country except India these animals would not be allowed to live. They consume the food needed by the working animals. From my experience with cattle in India it would be a kindness to kill a great many of the extremely old and deformed cattle. They are often turned out by their owners who will not kill them to become the prey of wild animals. This is an exquisite form of cruelty. They are not properly fed and they generally die of semi-starvation after lingering to misery. A quick death will cause much less suffering, and as they are going to die anyhow, it is better to end their misery. The unwillingness to take animal life does not mean that animals in India are treated with more kindness than they are in other countries. One of the appalling things in India is the callous indifference to animal suffering. I spent a week in Bombay from the 9th to the 16th of October, 1926. I observed very carefully the oxen passing to and from the docks pulling the loads. By actual account over 97 per cent. of the oxen that came under my observation had their tails disjointed from being twisted by their drivers. It is not that the tail is disjointed and then the joints are replaced, but the tail is then left disjointed. In most cases the animals' tails were disjointed in several places. Anyone who has caught a cricket ball wrong and disjointed his little finger knows how painful that can be, even after it has been put back into its place. Again, I noticed animals being goaded most cruelly, beaten with big sticks, forced to work with gall sores under the yoke. I know of no country where cattle are so badly treated as they are in India. Very frequently the professional *gowala* who takes his cow and milks it as he goes from house to house does not allow the calf to get enough milk to grow. A poor under-fed, stunted animal results. While it is true that whole milk is far too expensive to feed the calves in India, it is also true that after the first two weeks the calves can be fed on skim milk and milk substitutes, so that the calf can be well fed, well nourished, and make a normal, healthy growth for much less cost than when whole milk is used.

Again, in most of these countries the ox is not needed as a draft animal, horses are used, whereas in India a large majority of the males are used for draft purposes. In the countries outside of India where cattle are used for draft purposes cows are used for ploughing as well as oxen. Twice I have crossed continental Europe by daylight and have noticed a very large number of mature cows with big udders that were engaged in pulling the ploughs. From the standpoint of milk production, this is very bad.

While the cattle of India measured by European standards are not economical or of first rate quality, with few exceptions, they are without question

the best tropical cattle in the world, and for this reason are very valuable for crossing purposes with cattle from Northern regions that are expected to live in some tropical or sub-tropical regions. The immunity to disease, the ability to stand a hot climate, the very high digestive efficiency of Indian cattle are all factors of very great importance and value. There are breeders in the United States who would gladly give several thousand rupees each for well selected, well grown bulls of the best and largest breeds of India, but clamour has restricted the export of these animals in most cases. I believe that a good export market for India's cattle would be one of the very best incentives to improve India's cattle. If a breeder knew that at two years of age his best bull calf might realise Rs.5,000 for export, and that if he got a better bred one the price would go even higher, he would be induced to improve his cattle very much. One of the greatest drawbacks to the improvement of the cattle of India is that there is so little inventive in the way of a reasonable price to induce the breeder to improve his cattle. So that a carefully controlled export trade of cattle would be a great incentive to produce better cattle in India. In the *Breeders' Gazette* for 18th November, 1926, we are told of some ⅝ Shorthorn and ⅜ Indian cross-bred steers in Texas that average about 1,000 pounds each live weight at one year of age, and sold (25 head) for an average of Rs.315 each. The correspondent declared them "to be the most distinctive load of fat cattle in America."

My observation leads me to believe that there are far too many cattle in India to-day for the work needs of the country and for the cattle food supplies. After careful study, for a number of years, of the facts relating to cattle, I have come to the conclusion that India suffers an annual economic loss due to the surplus and inefficient cattle of over two crores of rupees (Rs.2,00,00,000). At least 90 per cent. of the cows do not produce enough milk and offspring, manure, bones and hide to pay for their food, stabling and care. About 80 per cent. of the oxen do not give a return in work and manure and hide and bones enough to cover their cost of production and maintenance. One goes to the fairs in most parts of India and prices the three-year-old ox, just ready to be broken into work, and then makes a rough estimate of the cost of production of these bullocks. He will be struck with the fact that the breeder must have exceedingly cheap fodder and milk to rear them on, and must not put a high value on the labour of those who care for them. Three-year-old oxen sell from Rs.40 to 75 each, even where there is abundant grazing, and milk sells at 20 lbs. to the rupee. This would prove upon strict accounting to have involved the breeder in a loss of money. Again, there are very few parts of India where a cow would pay if she gave less than 2,000 lbs. of milk per year. My observation leads me to believe that 90 per cent. of the cows of India give less than 1,000 lbs. of milk in a year. There are half a dozen so-called dairy breeds of cattle in India: the Sahiwal, the Khanewal, the Montgomery, the Sindhi, the Kosi, the Hariana and the Hissar, &c. In certain cases some of these herds have been kept fairly pure by the Government Military Dairy authorities. Inferior animals have been weeded out for a number of years. The latest I heard was that there was no pure bred herd of Indian cattle consisting of 50 animals and over that averaged 3,000 lbs. of milk per mature cow per year. As far as my observation goes less than 25 per cent. of the cows of the best dairy breeds of India give over 2,000 lbs. of milk. This 25 per cent. may be on an economical paying basis, but the 75 per cent. involve an annual economic loss.

While it is undoubtedly true that it is very difficult to introduce foreign cattle into India, it is the only way up to the present in which milk can be secured in large quantities at a reasonable price. The crosses that have been tried are usually imported bulls for sire and Indian cows for dams. The milking Shorthorn especially from Australia, the Ayrshire, the Holstein-Friesian, the Jersey, the Guernsey, the Brown Swiss, have been used. Where good pure-bred Indian cows have been used, the half-bred daughters give anywhere from two to six times as much milk as their Indian dams,

or from six to fifteen thousand pounds of milk per year. In most cases it looks as though we could not go beyond half-bred. The three-quarter bred, i.e., three-quarter foreign blood, one-quarter Indian, usually lacks constitution and stamina, ability to stand the climate, is little immune to disease. The half-bred, on the other hand, seems to inherit the milk faculty from the sire, and from the dam the immunity to disease, the ability to stand the climate, and a higher digestive efficiency. One very urgent problem, therefore, is to establish new breeds of cattle from the half-breds. This will be difficult and slow and expensive. The only alternative is to build up the purely Indian breeds. Where the best of the Indian breeds have been well looked after, carefully bred and every inferior animal culled out, the process has been so slow that in the long run it looks as though the building up of the indigenous breeds would be more expensive than the establishment of the new breeds from the half-breds.

There is at least one very important and significant exception to the rule that the three-quarter bred and beyond is of little value for milk. This exception is the Holstein-Friesian cross. From records now existing in the Government Military Dairies it looks as though the Holstein three-quarter and seven-eighth and even a higher percentage of imported blood continued to increase the milk capacity. Cows in the Lucknow Military Dairy with Holstein sires have given as high as 15,000 lbs. of milk per year. The Holstein is one of the biggest boned, largest framed animals in existence. So that when this is mated to cows of the large Indian breeds like the Hissar, Nagore and Nellore, the female is an excellent milking animal, while the male makes a very powerful, courageous, draft animal. This is the ideal dual purpose for India where the females give large quantities of milk, and the males are valuable as draft animals. Of the so-called Indian dairy breeds to-day, with one or two exceptions, the males are not worth feeding for draft purposes. They cost Rs.200 to Rs.300 to bring them to the three years of age, and sell for Rs.75 to Rs.150. Most of the half-bred bulls with foreign blood are no good for transmitting milking capacity, but the bull with Holstein-Friesian blood seems to transmit milking capacity, so these bulls can be used for grading up Indian cows. Few people in India understand that one cow giving 10,000 lbs. of milk per year gives more profit that 50 cows giving 1,500 or 2,000 lbs. of milk per year, to say nothing of the smaller outlay for barns, pasture, labour, &c., and if the bullock from such a cow weighs 15 hundred pounds or more it is worth from Rs.250 to Rs.350 at three years of age, whereas a bullock weighing 600 lbs. to 1,000 lbs. is worth from Rs.40 to Rs.100, and does not pay to rear. So my suggestion for improving the breeds of live stock in India would be to continue the policy of the Government Military Dairies and the Imperial Dairy Expert in collecting and carefully maintaining herds of the best Indian breeds, and by a process of selection and rejection of all below a certain standard gradually build up profitable herds of indigenous cattle. This should be a field where the large landowner could serve his country.

Secondly, what I believe will be more economical and much quicker in the long run is to take some of the best of the indigenous cows, mate them with carefully selected imported bulls of dairy breeds. From the half-breds, establish new breeds, and continue to experiment with a number of combinations to see what is the most economical for the production of milk and draft animals for the different parts of India. Use foreign bulls to grade up dairy herds.

One very practical way of improving the cattle of India would be to breed only from the best; to prevent the maimed, the halt, the undersized and the unfit from breeding. Allow them to live to a good old age if need be, but breed only from the best. In a few years most of the unfit would have disappeared, and the whole standard of the quality of Indian cattle raised without doing any violence to religious sentiments.

So far I have omitted all reference to the buffalo. The buffalo has distinct possibilities. At present good Mohrir buffaloes and Gujarati buffaloes produce more and richer milk than cows. Buffalo milk varies from 7½ to 9 per cent. of butter fat. The Government Military Dairies have a number of animals giving from six to eight thousand pounds of milk per year. This makes the buffalo cow distinctly profitable. The difficulty is, however, that the buffalo is a very heavy feeder, and does not always produce milk and butter fat as cheaply per pound as the best cow will produce milk and butter fat. In addition, the milking strain buffalo male is not nearly so valuable for draft purposes as the bullock. The natural habit of the buffalo is to feed at night and to lie in water in cool shady places in the day. Where buffalo bullocks are used for draft purposes they are not so nearly so efficient as the cow bullocks and frequently cannot stand the heat. An ox can thrive and work in the hot weather where a buffalo will drop dead. It might be possible to breed a strain of buffaloes where the males would be able to stand the Indian climate. But for the present I believe there is more hope of getting a good milk cow to produce a good working bullock than there is to develop a buffalo that will produce a male able to stand the work that a bullock can stand.

(*a*) (ii) *Betterment of the dairy industry in India.*—According to the report of trained observers it is exceedingly difficult in any Indian city or small town to buy either pure milk or pure butter or pure *ghi*. Milk is most frequently adulterated with water. If it were clean water it would not be so bad, but it is very frequently adulterated with water from the village tank, which is little better than raw sewage. The butter sometimes contains as high as 50 per cent. of curd, skim milk, salt and either vegetable or animal fat. *Ghi* is adulterated with a great many different oils and fats. In an Indian Court not long ago a Mohammedan Judge had to dismiss a case where it was proved that *ghi* had been adulterated with pig's fat, as the prosecution had not proved that pig's fat was harmful for human consumption. In like manner it has been proved that *ghi* has been adulterated with cows' fat, but no conviction was possible. One thing that India needs is pure food laws: but more than the laws is needed a willingness on the part of the people to recognise that good milk and butter and *ghi* cost more money to produce than adulterated, inferior milk products. There is a traditional market price in most parts of India for milk and butter and *ghi*, and while the real price of these things has increased, the price charged to the public has not increased in like proportion. The dealer in these articles has made up the difference by selling adulterated articles. In some cases, milk and its products are treated with such heavy doses of preservatives that the material will keep indefinitely and might be used as souvenirs. The effect upon the infant human stomach can be imagined. At present few people in India are willing to pay the price for pure, fresh, unadulterated dairy products, and until India is willing to do this there is little chance of betterment of the dairying industries. The honest dairyman is greatly handicapped by the competition of the dishonest dairyman.

In certain parts of India where there are very large grazing areas enormous herds of buffaloes and cows are kept. These animals pay very little for grazing rights though the grass often grows on good rich land which would pay well to cultivate. If the cultivators go on to these ranges and try to farm they are likely to suffer at the hands of the professional herdsmen, who break down the fences, drive their cattle on to the growing crops, and carry on such a determined warfare that usually the cultivator gives up in despair. So these cattle do not have to give as much milk in order to pay as where animals are kept in the ordinary way. These wandering tribes take out *ghi* in a very unsanitary fashion and waste all the skim milk and the curd. In some of these tribes, during the course of a season, enough skim milk is thrown away, which if it had been saved and turned into powdered milk or casein would have enabled the tribe

to settle down and build a village and educate its children and really live better than it is doing at present with its wasteful and extravagant methods. I believe that the instruction of these tribesmen as to the value of a milk factory is well worth the attention of Government. The jackals that follow these tribes are usually very fat and well favoured.

(*b*) (i) Regarding the over stocking of common pasture in most parts of India, this causes the rapid deterioration of the quality of the cattle. Overstocked pasture grows much less grass than where it is properly treated. Much of the barren waste one sees from the train is overstocked pasture that will take years to reclaim and can only be reclaimed by cultivation with rotation of crops. In general, pasture in India does not pay. In most parts of India cattle are so numerous that for most of the time they seem to be wandering hungry over a desert. It is only during the latter part of the rains and for a month or two after the rains that cattle that depend upon grazing have enough food to eat. Over a great part of Northern India and the Central Provinces and Central India, the cattle put on weight just after the rains, and are reduced to skin and bone before the next rains come round. This annual recurring process of abundant food and then semi-starvation might not be too serious for mature cattle, but the young stock, the calf (e.g., which has been weaned as the famine period comes along) do not get sufficient food to make decent growth. No matter what happens afterwards to a calf that has had insufficient food during the first nine months of its life, it will never make up what it has lost. It will remain stunted and inferior. Because the common pastures carry far too much stock they do not grow as much grass as if they had a reasonable number of cattle and were allowed periods of rest. The great difficulty with the common pastures is that the cattle are on them 365 days of the year; this does not give the young grass a fair chance. It is nibbled off before it has produced a reasonable weight. It can be proved that the best way to produce abundant food for cattle is to greatly reduce the grazing areas on culturable land, grow fodder crops like sorghum, maize, *bajra*, or during the cold weather wheat, barley, oats, peas, *chana*, &c., where the grain is shared by men and cattle, but the cattle get all the stalks. Again, a great many of the weeds and grasses and thorn bushes that cattle will not eat in the ordinary way can be turned into good succulent fodder if put into an ordinary earth pit silo.

The ordinary common village pasture, for nine months as barren as a gravel parade ground, is the greatest single enemy in the way of cattle selection and improvement. There are usually a number of bulls totally unfit for breeding running with the herd. So that India seems to be progressively breeding from the worst. Also for spreading disease there is nothing more effective than the common pasture.

A few general observations on the situation in India.

Far too large a proportion of the population of India is engaged on the land. At least thirty per cent. of this population must be diverted to industry, commerce and transportation if agriculture is to be profitable in India. To-day less than 30 per cent. of the population of the United States in engaged upon the land; 70 per cent. in other pursuits. This is possible because of the large increase in agricultural machinery. Improved machinery, and a lot of it, widespread in use is fundamental to prosperity in India. For the most part the crudest farm implements are still in use. These give the farmer very little average. He is little better off than a man working with his bare hands. An American or British farmer would not make any better showing than the Indian farmer if he had to work bare-handed or with as little as the Indian has to do with.

Agricultural machinery frees the farmer's life from its severest toil and its most debasing drudgery. It multiplies his productive capacity and therefore his wages and profits.

Agricultural produce is in world markets and the competition is very keen. Due to lack of machinery, superstition, ignorance, dishonesty, oppression, comparatively poor transportation facilities, poor farming methods, bad seed, the Indian cultivator is at a serious disadvantage compared with the farmers that are educated and proficient. So that with the present methods the Indian farmer is in a vicious circle, far too many men work on and must live off the same small piece of land. Human life and labour is the cheapest and least efficient of all commodities sold in India. To get some of it off the soil and into productive industry is of the first importance in agricultural progress in India.

Then too it must be remembered that with the present faulty methods of distribution (in the economic sense) of commodities, a large crop may be ruinous to the farmer. If India with its present population and standard of living has a good crop of any staple commodities which also coincides with a good crop in other parts of the world, the price the Indian farmer receives is likely to be less than the cost of production. So what is needed is not a cry for economy, but a cry for increased consumption, not a philosophy which calls for few wants and those easily satisfied, but a philosophy which recognises that the wonderful variety and wealth of commodities in the world are for human use and service. A more complex and richer life is highly desirable in India. We need not only more people to consume, but a higher standard of living so that each individual will consume more of that which is produced. One of the discouraging factors of Indian life is that it is so slow to demand a higher standard of living. A higher standard of living must be at the foundation of any improvement in Indian agriculture.

APPENDIX I.

After-careers of the students of the Agricultural Institute, Allahabad.

Number of persons trained by the Institute from 1912-23	101
Number serving in the Agricultural Departments (mostly of Indian States)	28
Number farming their own land	6
Number serving as teachers in Agricultural Schools (mostly Missionary)	15
Number serving as teachers in General Schools	6
Number serving as Rural Secretaries of the Y.M.C.A. ...	2
Number studying agriculture at Edinburgh	1
Number serving in the Revenue Departments (Indian States)	11
Number serving in the Forest Departments (Indian States)	2
Number serving in the Co-operative Departments (Indian States)	2
Number receiving training for Mission Co-operative work	1
Number serving in other Departments	3
Number whose present employment is not stated	21
Number deceased	3

APPENDIX II.

Note on cross-breeding by Dr. H. G. Kribs, Ph.D., Agricultural Institute, Allahabad.

It is hardly necessary to go into the principles that underlie our appreciation of the value of cross-breeding—this I will do later.

The fact is that every gene (the factors that are responsible for the development of unit characters) is in a condition of unstable equilibrium, and gives evidence of its unique individuality best when its mate shows a slightly different hereditary thrust or is widely contrasting. The significance of amphimixis lies in the introduction of these variations.

In the development of a dual purpose cow in India four general characteristics are needed—milk, temperature, disease and endurance adaptations, each of which depends upon certain genetic combinations for its expression. In India milk giving power has been reduced to a minimum through natural selection, the others are virile.

The milk giving power can be brought back in selected strains by a long process of artificial selection (breeding), or by cross-breeding with another type that could stimulate the milk giving genetic combination without disturbing other factors that are essential.

Such a combination would seem possible by crossing the dual purpose Ayrshire of Scotland, relatively high in milk production, with the dual purpose cow of India, low to vanishing in milk production.

This has proven unprofitable because the selective sortation of genetic material that developed a successful issue in the one (Ayrshire) is impossible in the other (*deshi*). The Ayrshire has developed to its present profitable rating with a genetic combination that favours a heavy hair coat, and limited pigmentation and glandular secretion in the dermis.

Any contribution that the *deshi* cow can make toward a profitable dual purpose must be associated with a high hair coat, abundant pigmentation and free functioning of the dermal glands, so that while the F_1 generation of such a cross may show hybrid advantages here and there, further crossing necessarily sets free allellomorphs that inhibit the end in view.

The Holstein-Friesian, on the other hand, will cross with *deshi* cows, especially Hariana, and throw a profitable genetic combination for dual service for several generations. This seems contrary to general cross-breeding expectation, as from the F_2 generation onward unfavourable combinations usually arise.

In the case of many cows raised by Colonel Matson at Lucknow, the genetic grouping for constitution, temperature, disease resistance and milk is seldom disturbed in crossing back or in crossing hybrids. I have checked 25 or 30 progeny of this sort, and find excellent results, the milk yield being from 4,000 to 15,000 lbs., with the other essentials undiminished in vigour. Many of these were crossed back to *deshi* three-fourths, seven-eighths and one or two fifteen-sixteenths.

Colonel Matson's results have been anticipated in certain crosses in U.S.A. and Brazil, where recombination (chromosomal or genetic) has taken place after crossing Indian bulls with American types, and a highly resistant breed has developed.

Evidence seems to be that the crosses are not between heterozygous strains, and such recombination takes place readily in cows when there is no "roughing" factory involved, a factor which the Ayrshire seems to introduce, but the Shorthorn and Friesian do not.

Oral Evidence.

38,531. *The Chairman*: Mr. Sam Higginbottom, you are Principal of the Allahabad Agricultural Institute?—Yes.

38,532. You have been good enough to give us a note of the evidence which you wish to put before the Royal Commission; is there anything you would like to say in addition to that at this stage, or are there any corrections which you wish to make?—Dr. Kribs of our staff was kind enough to prepare a note on cattle breeding and crossing which I sent to the Secretary.

38,533. Yes, we have that. Are you paying any local taxation or cesses?—On the original grant of land we are not, but on all the rest we are paying the ordinary land revenue.

38,534. But no local taxation or local cess?—Not as an institution; the District Board has taxed us personally about as much as the income tax, but not as an institution. The second statement,* which is with regard to the trenched field, you will notice is an approximation; that is a field to which I called your attention the other day as we passed it. We estimate 20 maunds of grain per acre for the 2¼ acres field; unless we have a calamity that is about how it will work out.

38,535. *Mr. Calvert*: What is the grain?—It is *berri*; there is a good deal of mustard, barley, grain and linseed; it is the common mixture of the district; it was really a catch crop after *juar*, without irrigation.

38,536. *The Chairman*: Turning to your note of evidence, are you able to get into the districts and, apart from your duties on the farm, interest yourself in the ordinary problems of the cultivator?—Since my return in October I have not done so, but I got round a good deal before that, and especially while I was Director of Agriculture in Gwalior. From 1916 to 1919 I got into a great many villages in Central India, and it has been my custom to go regularly into villages near by us so as to keep myself in touch with the conditions under which the farmer is working.

38,537. How long have you been in India?—Since November, 1903.

38,538. In various posts?—I first of all taught economics; I then got the idea from studying the villages with groups of Indian students that we should be teaching agriculture; so my Mission gave me permission to study agriculture, and, if I could raise the money, have an agricultural institution. I returned from Amercia after my first furlough in 1911, and all which you saw the other morning has come since that time.

38,539. I think you said a moment ago that you were in Gwalior State?—Yes. That was a war measure. The Maharajah of Gwalior got me to draw up a scheme; then I advised him to get the best officer the British Government could let him have; he pointed out that during the war every man was busy; the British were not likely to be able to spare a man at that time; he said: "It is your scheme; you carry it out." So I took it on for three years. Then, when he could get other officers, I left it.

38,540. You point out, in answer to our question, that close co-ordination between the provincial departments and any central research department that may exist is essential. Have you pondered at all the way in which you would suggest such co-ordination might be achieved?—I am not a Government servant, and I do not know always what is at the back of actions taken, but as an outsider it seems to me that the greatest hindrance to this co-ordination is the inequality of pay; an Imperial officer is in a different grade from a provincial officer, though the Imperial Department is very largely recruited from the provincial departments, from men who have served their apprenticeship in India in a particular Province. Government rules are naturally inelastic in the employment of men, but if there could be a little human understanding so that where a man is doing good work he

* Not printed.

might be recognised and kept where he is doing his work, without being transferred, I think that would be a good thing. As a rule, if a man succeeds in a post, he is transferred to some other job, possibly totally unrelated to what he has been doing, and all his experience is practically lost; the man who succeeds him may have a different idea of things and may tackle the problem in an entirely different way. I think it is a matter of preserving continuity; when a man has really got hold of a problem he should be left in that place until he has worked it out.

38,541. Are you familiar with the organisation of Agricultural Departments in the United States of America?—Somewhat; I made a study of them some years ago. There is no uniformity there; for instance, in Ohio State the experimental station is entirely separate from the University. The same is true of Cornell, and at the New York experimental station at Geneva; though some of the University Professors in agriculture do go out on various kinds of extension work, the experimental station is entirely separate. In Ohio it is at Wooster, 80 miles from Columbus, where the State University is; and Cornell University is at Ithaca; that is the New York State College of agriculture, with the experimental station at Geneva. In other States the experimental station and the University College of Agriculture are practically together, in different branches.

38,542. Then you have the Federal Department as a very powerful body indeed?—The Federal Department is powerful, and through the Smith-Hughes and Lever Acts, where States were slow to take up agricultural education, and where they were a little backward, the Federal Department, which might be considered to correspond to the Imperial Government, stimulated State activity by making grants to State local bodies. One does not like to suggest that India can learn much from the United States in those matters, but it is just possible; at least, there they have worked through this same problem of the relation of a central authority to the different State Governments. In the United States there is a good deal of co-ordination, not always official, but between men working at different problems; the problem interest will very frequently unite the man in Washington with the men in the different States working at the same problem.

38,543. Have you ever heard any complaints about or criticisms of the Central Department of the United States?—Only that it does not pay enough; all the men think they are too low paid, and I think they are. You do occasionally hear complaints, but the general consensus of opinion is that it is doing the work that has led to such great increase in production and crop protection, and that whatever criticisms are levelled against it are entirely outweighed by the economic value it has brought to the country.

38,544. On page 538 of your note you are talking about the improvement of wells. Have you studied the economics of irrigation by tube wells?—We have had a tube well for a number of years; it was one of the first put down; unfortunately it collapsed a few months ago, and we let a contract for a new one. We feel in our particular position that we cannot get along without a tube well; but I think a great deal more study needs to be done on tube wells; not enough men properly qualified have been working on them. For instance, when we put our tube well down it cost us about Rs.20,000, and the understanding was that it would practically last for ever; it has lasted ten years, and its collapse comes at a time when my budget is full with other things, so that I do not know how I am to pay for a new one. But we must have a tube well; we must have water for our dairy.

38,545. When you say it collapsed, what happened?—I am not an engineer, but as far as I can gather from the engineers, the Ganges sand

was finer than the engineers had thought; it had come through the strainer and had left cavities. As I understand it, the Ganges valley is an ocean of water-bearing sand, with islands of clay in it; when we had sucked the sand out from under a bed of clay, that clay fell in and simply crushed the tube like an eggshell. That is as I understand it, but I am not an engineer, and I can only repeat the explanation that has been given to me. It seems reasonable.

38,546. Quite apart from this study of the purely technical problem, there is the field of economics, that is to say, the problem as to what type of land it pays to irrigate from tube wells, and what class of crops must be grown in order to pay for the water so raised?—Yes. As I remember it, its cost varies from two to four annas per thousand gallons of water raised from our tube well; that cost varies under different conditions. That means that you can only grow money crops; crops that have a value. I doubt very much whether it would pay to irrigate wheat on ordinary land in this district with a tube well; you have got to have crops with more money in them than that. I think sugarcane would pay when sugar is at normal prices; we might then have wheat in the rotation; tobacco would pay, and turmeric and all kinds of garden produce would pay well under tube well irrigation. I have not yet been able to find anybody who could give me very much accurate information about it; there is a good deal of guessing. Our water table varies very much; the strata into which you bore and the amount of water that can be got from a tube well vary very much. As far as I understand, no engineer can tell you how much water you are going to get if you put down a tube of a certain bore. I take it that means that a great deal more experimentation and investigation must be done. There are so many wells in India, and there is so much land that can never be irrigated by flow irrigation: if it is ever to be irrigated at all it must be irrigated from a well with subsoil water, and we have an ocean of it at our feet; the question is how to get that water on to the land economically.

38,547. On page 538 you are dealing with the question of contour irrigation, and you point out that terraced land is very often so costly that the subsequent cultivation cannot pay for the cost of the work; you say that therefore a number of officers skilled in contour irrigation methods is needed. Is it your suggestion that officers of that sort could so improve the methods of contouring as to make it an economic investment?—Yes. There are millions of acres to-day that are commanded by water, but because they are not level they are not irrigated. If the water is put on them as they are now, it simply runs down the slope to the bottom, instead of being taken in contours and zigzagged down. The secret of contour irrigation is to irrigate on the slope, never to allow the water to have much movement on it, but keep it constantly zigzagging down. Over a good part of central India that I know there is water available, but this sloping land is not irrigated because people think it must be terraced before they can irrigate. I presume most of the terracing work that has been done in India was done without taking any account of the cost of labour; the people doing the work had nothing else to do and so they did it, whereas if their labour had had a value and they had kept accounts, they would never have done it.

38,548. I think you have had great success with this method of preventing erosion, and indeed, of encouraging the depositing of silt, by building of small bunds?—Yes, and we felt that this method could be multiplied over a great part of India. It has already been done in some parts. I got the idea from Sir Sydney Preston's work in Gwalior, where he has put up a great many of these bunds. But there is one thing which we have not worked out yet. Some of these bunds collect an enormous amount of water. In this part of India at any rate, some time early in October we

let all that water out; it runs down the natural drainage channel and is lost. Of course, it is true that if you leave it in the tank you can grow no crops in the tank bottom. I believe that when we release that water there are some crops that could be grown on, say, one watering, so that if as we let that water out of the tank it might serve a purpose rather than be entirely lost. We ourselves are studying that problem now. The trouble is that frequently the cost of doing the thing is so high that it would not be an economic proposition.

38,549. Let us see: you build your bund at the proper place, then at the end of the rains you leave the water sufficiently long for it to deposit its silt, and then you let the water go down the natural channel past the bund in order to make the silt available for cultivation?—Yes. For wheat or any *rabi* crop.

38,550. And your idea is that below the level of the bund there should be some cultivation which could be aided by one single watering?—Yes. I believe that is another thing which needs to be worked out. A good many irrigated crops depend upon rain some time in December or January. If we could give the plant a good start by the use of the water from behind the bund just before sowing, we would almost certainly get a good crop.

38,551. We noticed when we were going round your farm that you were applying sewage to the land? Have you had any experience of sewage sickness?—Not on our land.

38,552. Are you at all nervous about that?—Yes; the municipal sewage farm is just at the other side of the railway line; it is badly over-dosed with sewage and needs opening up and also more cultivation. There is altogether too much sewage available at Allahabad for the amount of land that they are trying to put it on. For a number of years I have been trying to prevent that sewage going into the river. We have also learned that sewage is a very dangerous thing as far as the public health is concerned. If the sewage is used on vegetables that are eaten raw, internal parasites such as tape-worms, round-worms, pin-worms are a danger. I am now having a weekly test made by a trained man. He takes a sample of the sewage once a week; and also tests the vegetables and the chewing variety of sugarcane offered for sale. After washing them very carefully, he then puts the liquid under the microscope.

38,553. What organisms does he find?—He finds tape-worms, round-worms, pin-worms and a little of *amoeba* of the dysenteric type.

38,554. By what process is this municipal sewage treated?—None at all, it just comes over the river as raw sewage. That means that a great deal of land is necessary. Fortunately we have a great deal of sandy land which is highly absorbitive and easily workable. I do not think a stiff clay or some of the black cotton soils would be suitable, as they hold the water for a long time; but fortunately there is a great deal of sandy soil there whose absorption powers are very great, and, further, it is very easy to cultivate that soil soon after irrigating it.

38,555. On page 539 you are dealing with the question of the introduction of improved varieties of sugarcane, and you point out that while the Government stations have managed to evolve very excellent strains their adoption by the cultivator is slow. What is your own experience in that matter? Are you growing Coimbatore canes?—Yes. We are growing 213.

38,556. Are you growing any *deshi* sugarcane at all?—No; they are not worth the land.

38,557. Only improved canes?—Yes. I think that India is more favourably situated for the production of sugar from cane than perhaps any other country in the world; and I am very glad that the Government is taking

interest and is breeding better canes. The question now is to get the cultivator to see the results and adopt these improved varieties. The consumption of sugar in India, I think, is only about one-fifth of that in the United States, and I think that, considering the Indian is generally a vegetarian, the consumption ought to be much greater than it is, except that perhaps in the case of the well-to-do classes, or the middle-aged lawyers who develop diabetes from eating too much sugar, because they are usually people who lead luxurious lives, whereas this is not the case with the labouring classes who work very hard, and sugar acts as a source of energy to them.

38,558. Then you deal with this problem of the monkeys, or at any rate you set out the problem and you enclose a letter* from a gentleman whose view is that the greatest contribution that the Government of India could make would be to provide free railway transport for monkeys?—Yes; was not a trainload of monkeys trapped at Brindaban and sent down to Katni? The residents of Katni wanted to know why they were made the recipients of this blessing; they could not understand why they were so favoured, and said that they would be only too willing to forego this pleasure. This wild animal problem just now gives me more cause for consideration than almost anything else. Maize, for instance, will give you four to eight times as much grain as the best variety of *juar*, and it is one of the best foods for man as well as beast. On our sullage water I think we could grow 80 maunds per acre of good Southern maize. We very seldom get 20 maunds of *juar*, or *sorghum*, and yet we find that it is almost impossible to grow maize. If we could succeed in keeping the crows and the porcupines and the jackals away from it, it would be a good thing indeed. I know I had a plot of some very fine seed maize, and I put four watchmen to watch it. One night I went round the place and I noticed a big fire blazing. When I went up to the place I found the *chankidars* roasting a number of the ears of corn that they were supposed to be watching and protecting. This shows that the cost of protecting your crop is very great indeed, not only against wild animals, but also against human beings. That gentleman who sent the letter to the Press regarding monkeys very frankly does not face the issue. The difficulty is that the monkey catcher catches the monkeys from his village at eight annas apiece and takes them to another village; then when that village is tired of them the monkey catcher goes there and receives 8 annas more for each monkey, and he may transfer the monkeys back to the village from where he took them. This process of transferring monkeys from one part of India to another does not get us any further forward.

38,559. Have you any constructive proposals to make with regard to this question?—The only thing to face is the killing of wild monkeys, which would wound the religious susceptibilities of a great many of the people of India. The monkey knows nothing of birth control, and he simply goes on multiplying, so much so, that he has become a very serious pest to our farm. Some of them know that it is dangerous to come right into the farm, but they just keep round the corner and do a great deal of damage.

38,560. *Sir Henry Lawrence*: Can you remove them to the forests, or would they come back again to the cultivated areas?—The monkey would go wherever there was food to be got.

38,561. Can they travel very long distances?—I do not know; but I think they will go a long way after food.

38,562. *Mr. Calvert*: Was there not a very roaring trade in the export of monkeys at the time of the monkey-gland treatment?—I do not know.

38,563. *Professor Gangulee*: In shipment only?—I suppose so. But if we could develop a trade like that it would be a very fine thing indeed. We have got to get rid of them. Naturally, having many good friends among

* Not printed.

the Hindus, I am not willing to suggest anything which I know is going to wound their religious susceptibilities.

38,564. *The Chairman*: Have you noticed any change of opinion in that respect during the years that you have been in India?—There are two opinions in this matter I think; one opinion a man is willing to express in order to exploit a political object, and another which he will tell you in private.

38,565. *Mr. Kamat*: But if the monkeys were killed by non-Hindus, do you not think that the Hindus would manifest a spirit of tolerence?—Sometimes you might be safe, at others you would start a riot; it all depends upon the circumstances.

38,566. Supposing a party of Mahammedans killed the monkeys what would the Hindus do?—I remember a few years ago a havoc was wrought by monkeys and one of them started biting the people. Somebody brought a boy to my wife with his cheek practically stripped off by this monkey. A party of Hindus got the monkeys up a tree and asked me to shoot them with my gun. I refused to shoot the animals saying that if I did anything of the kind I would probably be getting myself into jail. Subsequently one of my colleagues, on obtaining an undertaking from the people that they would not make a complaint to the Magistrate, shot the monkeys. As I say these were Hindus who came to us begging us to shoot the monkey, so that there is a time when even Hindus are willing to see monkeys shot. Of course, they will not do it themselves; they will ask others to do it for them. Again I say, it all depends on the circumstances. Very frequently the mere shooting of a monkey might be the spark to a big riot and that is a thing which any wise man would always wish to avoid.

38,567. *The Chairman*: On page 539 you deal with the question of agricultural education, and you give it as your view that the systems of education in vogue in the Philippines, amongst other countries, have made a great contribution towards bettering the agricultural practice. Could you tell us a little more about the curriculum and so on in the Philippines?—They have there very distinctly agricultural schools with school gardens where every child has his own individual plot and he goes into his garden at regular hours, grows things under supervision, the child doing the work and getting the produce.

38,568. Is that in the primary school?—I think it is from the very beginning. I do not know really. But in Canada they have done perhaps more than any other country on earth in the way of using these schools for teaching agriculture. There is one thing that I would like to say particularly with regard to agricultural education. Most of our education in India is so strictly literary that the only manual labour in which the pupil ever engages is the using of the pen, which certainly does call for a certain amount of manual dexterity! But we now know that manual dexterity, the using of the hands, is a marvellous stimulus to the brain; and has not India handicapped herself in failing to learn the use of the hand? There is an article in a recent issue of the *Scientific American*,* by Professor G. Elliot Smith, on the meaning of the brain which brings out the enormous improvement in education obtained by teaching the use of the hands as a stimulus to the mind. I do not know whether that answers your question. Then in the Southern States of America also they have done both; they have had the village school where, as soon as a child went to school, he was put on to doing something in agriculture and the girls were doing something about home making; and then the farm demonstrator was going out to the parents of the children in the school. Conditions in the Southern States of America a few years ago were just about as bad among the Negroes as they are in rural India; most of those bad

* January, 1927, page 16.

conditions have been wiped out through agricultural education to the child in school and the adult on his farm.

38,569. Would you agree that it would be a great advantage if it were possible to devise a curriculum in agricultural schools which would result in a considerable proportion of the students passing through such institutions going back into the business of farming on a commercial basis? In other words, would you not regard it as a feather in your own cap if a larger proportion of the students who pass through your institution went in for farming?—Yes; but I think it is well to bear in mind that amongst the systems of education, agricultural education is recent; it is modern compared with a good deal of other education. If you study the history of agricultural colleges in the United States, you will find that, in the first few years, of those who graduated, less than 10 per cent. got back to actual farming and 90 per cent. were absorbed as teachers and demonstrators. Then there came a time when the teacher positions were very largely filled and it required only 15 to 20 per cent. to keep them going, so that we actually got over 60 per cent. of those trained going back to their own land or their fathers' farms. I think India will have to repeat that experience. The great difficulty to-day in starting anything is, where is the man to do it? So many of the men studying in the agricultural colleges of India are not being trained as farmers. They are being trained as laboratory technicians of one sort or another having had little if any experience of farming. I remember the Principal of a Government Agricultural College once remarking to me that he could never understand why he had been appointed, as he had never learnt how to grow a bunch of onions; he was one of the finest Economic Botanists. I think that is one of the dangers we ought to wipe out. Among our teaching staff for agriculture in India we must try to get some farmers as well as strictly scientifically trained men.

38,570. Do you find that the cultivators from the neighbourhood come and see your farm?—Yes, a great many come. I think if we had a dozen iron ploughs with oxen we could rent them out from the close of one monsoon to the beginning of the next. We have done a little of that, but we have not had the equipment and the staff to do that sort of thing. We have also sent our silage cutting outfit to some of the villages and filled earthern pit silos with silage for them. We could do a great deal more if we were not so shorthanded as far as trained men are concerned, as also equipment which takes money to provide. Our experience is that if we do not rush too fast these Indian farmers grasp the thing and when they are satisfied that the way of doing it is right they are willing to try it. The farmers round us have now sufficient confidence in us; I have talked with a great many of them and I said "You know this land and you know that it produces more now than it did; to what do you attribute the increase?" They say, "It is because you use these ploughs which not only go deeper than ours but they actually turn the soil over, so that you are constantly adding manure in the stubble, &c." We are greatly encouraged by the way our neighbours have copied us and are eager for our help; they come constantly with requests and I wish we could do much more than we are now doing for them.

38,571. Have your neighbours showed any signs of wishing to copy your practice of bunding streams and so preventing erosion and encouraging deposit of silt?—Yes; a number of them have come and said, "in our village there are conditions like this; if you would put the bund we would pay for it." Thus each one whose land is bunded would pay his proportion of the cost. That is, you put in a *bund* which reclaims 50 acres, and one man has 5 acres and another 10 acres reclaimed; each man's land is benefited and each would pay his proportionate share and thus the whole thing would be paid for. That is one thing we are very anxious to do. For

instance in the Mirzapur district we have been asked by the villagers themselves to help them.

38,572. And where you have attempted that work, have you financed it by means of loans?—We have not actually done it yet because we are so busy and shorthanded that we could not give the time to it without neglecting our classes. It seems as though every college should have one or two handy men who could be definitely assigned to such work. When a man has a class to teach, he cannot do his duty to that and go out as he should.

38,573. Do you form the view that there has been progress in agriculture as practised by the ordinary cultivator in India since you have been in this country?—There are centres unquestionably where very much better practice obtains now; there are centres where great progress has been made; but I do not know whether you could apply that in general; for instance, if you ride on the train from Allahabad to Cawnpore you see wretched cultivation and miserable crops, and the enormous amounts of waste land which would respond to better methods; but I do know of places where great improvement has taken place.

38,574. Do you think that rural public opinion is moving at all? Do you think there is a growing demand for better things?—Indeed I do; that is the most encouraging thing; a great many of the landlords are showing to-day much more interest in rural development than I have seen before; I think that is increasing.

38,575. In your experience, have you found literate cultivators more easy to approach with suggestions for improvement than illiterate cultivators?—It is very few villagers who are literate at all. The man who has been to an agricultural college or to an ordinary college and is an educated man is usually the man who is asking for more information and better methods. For instance, hardly a day goes by when some land owner or other does not come for help and advice on some thing or another; he intends to go back to his own land and try and put it in practice, say with regard to machinery, improved ploughs and things of that sort.

38,576. If a forward movement is to be made, in what direction do you think it ought to be made, mainly in the direction of education or in the direction of further technical advice in the shape of demonstration and propaganda?—It is almost impossible to say that any one thing is separate from the other; it is a whole army moving forward together.

38,577. You would rather advance all along the line?—Yes; I have no faith in the quick and ready methods in either education or agriculture. One thing depends upon another so much; they need more education; they need more technical advice; these things are not mutually exclusively; they must go together.

38,578. And probably sanitation, better drinking water and so on is as important as anything else?—Yes, better health; that is also part of the programme.

38,579. *Sir Henry Lawrence*: In this book, *The Gospel and the Plough*, you refer to the extent of teaching given by Colonel Hudson in the jail. Have you known of any other jails which are centres of agricultural improvement?—No; I have only known of that one. I believe there have been others,* but that one was my neighbour, and I had good opportunities of seeing it.

38,580. Do you think that more might be done through teaching methods of improved agriculture to the jail population?—Yes; it is one of the finest schools we have got because we can compel attendance.

* Colonel Palmer of the Naini Central Jail already has a scheme up before the Local Government for teaching agriculture.

38,581. I think Colonel Hudson was managing it very well and he never had any trouble; it had a profound effect upon the prisoners, because of his interest in giving each one a chance.

38,582. How long did it work, for ten or twelve years?—More than that; I first knew him in 1903; he had been at it for some time then, fifteen years at least.

38,583. Do you know how many people pass through jails in India?—I do not know. I believe the United Province is the largest single jail administration in the world, about 55,000 persons. I do not know what it is for the rest of India.

38,584. I think it is from 500,000 to 700,000 in the course of the year; so that it would be an education on a pretty considerable scale if it were adopted?—Yes, and you know that can be done under proper control. I never saw anything like the results that Colonel Hudson got.

38,585. *Professor Gangulee*: Colonel Hudson's work was chiefly confined to vegetable garden, I suppose, and he did not take up any crops?—He had good silos when Pusa did not even think of them. He had a very great advantage. He had been a Military Medical Officer for sixteen years and so was familiar with all methods of camp sanitation, and he went in for the system of trenching which he considered proper from the sanitary point of view. It was good from the farmer's point of view also.

38,586. *Sir Henry Lawrence*: Can you tell us something of your method of education and in what way you could link that up with higher education under the University? Have you any scheme for that?—Yes. When I began this work, I was looking forward to a college in agriculture which would give training to a young man in India equal to what he would get in Europe or America; but we have had an educational revolution here and the United Provinces students now get two years in an Intermediate College in the University. I am eager that our college should be affiliated to the Allahabad University.

38,587. Was there any obstacle?—It has not yet come to pass.

38,588. How long have you been working for it?—Ever since we began in 1910. I realise this, of course, that before we can expect recognition as an Agricultural College we must have the necessary staff and equipment, and it is only just recently that I felt we had sufficient equipment for the Intermediate. I do not think we have equipment enough now for a degree college; we need about three lakhs more of non-recurring expenditure for additional laboratories, hostel and equipment, and, in addition, a lakh of rupees a year to our income to pay for the additional staff so as to teach for the degree. I have had informal conversations with some of the University people, and they are enthusiastic on this. For a number of years I was put off by their saying that in this Province Allahabad University was an affiliating University, and that when any college was affiliated, the Cawnpore Government College would be the degree college. The Cawnpore College has not been an educational institution so much as a departmental institution for the training very largely of subordinates in the Revenue and other departments. It is only of late that it has been organised for the training of farmers. They do now offer a four-years' course for a Licentiate in Agriculture; but nobody takes it that that means a degree in agriculture; it does not. I doubt very much whether the four-years' course is up to a University standard in agriculture. Now that Allahabad University has become a residential University, I think that obstacle will be removed, because Cawnpore will go with the new Agra University, and we are within the geographical limits of the Allahabad University. It is a question now largely of finance, as I understand it. This is informal; nothing yet has been passed by the University, but from

informal conversations with the Vice-Chancellor and the men in the Faculty of Science, if I gather right the sense of the University, they are eager to add a Faculty of Agriculture. Then the question is: "Shall Government start its own agricultural college, or shall it make use of the facilities that the Agricultural Institute has?" The feeling in the University is that if they can have some control over the appointment of the teachers and the institution, it would rather have our institution than start a new one. We frankly recognise that the University has the right to lay down the course of study and to see that it is properly taught by properly qualified teachers. We are now working through those details so as to get it satisfactory to both parties.

38,589. So that you are on your way to achieving this result?—Yes, I hope so.

38,590. You do not see any insuperable obstacles now standing in the way?—I hope not; I do not know what is ahead of us, but as far as we have got it has been all right. It is a question now as to where the money is to come from.

38,591. Are you prepared to accept a Government grant?—Yes.

38,592. Have you asked for one?—No, not yet.

38,593. *Sir Ganga Ram*: Do you get any now?—No; in the life of the institution we have received two grants from Government, one of Rs.11,050 to help with the tube well, and Rs.42,000 to help us with our science building; but we have had no recurring grant of any kind. We have spent about 15 lakhs in developing the institution to its present state.

38,594. *Sir Henry Lawrence*: You are teaching a considerable number of Indians in your institution, are you not?—Yes, 70. Before we had any recognition from Government we had very great difficulty in getting students to come. You cannot blame the Indian student for desiring a degree; I would not have gone to Princeton if at the end of my tuition I should have got no degree. The Indian wants to go to an institution which is recognised and the degree of which means something.

38,595. Have you any Indians on your teaching staff?—Yes.

38,596. Is your teaching staff mostly Indian or mostly American?—We have eight Americans and at present we have only six Indians. Few Indians with the necessary qualifications are willing to live on our missionary pay. They can do better elsewhere.

38,597. Are these Indian teachers men trained in this country or trained in America, or where?—They are trained in this country; we cannot pay salaries that will satisfy the American trained men; we have had several who have worked on missionary allowances, but they say they can do so much better elsewhere, and they go. Our ideal would be to have about half and half Americans and Indians. Our difficulty in getting Indians is that there have been so few Indians with the necessary training. We want a man to do a particular job, and, other things being equal, to-day we would rather have an Indian; but where can an Indian get training in India in agricultural engineering? Where can he get training in horticulture? Where can he get a proper training in dairying? We are teaching dairying, but the course laid down is very short; you cannot turn out a first class dairyman in two years; it is utterly impossible.

38,598. So that at the present time, though you are anxious to obtain Indian teachers, you cannot find a sufficient number of men with sufficiently high class education?—Yes, and that is one reason why through thick and thin I have held out for an agricultural college; we must have some place in India in which to give the Indian the same chance that he gets in Europe or America. With the possible exception of Poona, there was no agricultural college in India where he could get that chance, and Poona was so very much

under-staffed, although for a good many years it was the best, and I think still is the best, agricultural college in India and has turned out the best men.

38,599. What is the practice in the United States? Are posts in these scientific institutions reserved for Americans, or do they bring people in? If they find a man of higher qualifications in Europe, do they invite him over?—Yes; it is amazing to contemplate the number of great teachers of agriculture that Guelph has supplied to the United States. The father of animal husbandry, Dr. Craig, was a Canadian trained in Canada, at Guelph, but that makes no difference. America has not sent to Europe for very many teachers, because Europe was not giving the kind of training that was wanted.

38,600. There are instances of men being imported from other countries to teach in the United States?—Yes, in certain things.

38,601. Do you know of any cases of men of outstanding ability?—I do not recall them now, but I know there are some; I did once make a list of the men from Guelph, a Canadian institution, who went into the United States and occupied very high positions. Some of the leading men who made their reputations in the United States were born and bred British, many of them being Canadians.

38,602. *Sir Ganga Ram*: Who advised you to put the tube well in?—The United Provinces Government. I might say that our tube well in the leper asylum was the first tube well put in in the United Provinces. When Mr. Moreland was Director, he said he had heard of these tube wells and would like to try them, and he said that if he spoiled our tube well he would give us a new one. I agreed, and he bored, and it has apparently given us a supply of water; we took from 12 to 14 thousand gallons an hour; it has gone on and we have never had any trouble; it cost us very little.

38,603. Did he take a section of the soil before advising you to do it?—I think he did.

38,604. Have you that section?—Not that I know now. Of course, this was in the early days of tube wells, and very little was known about them.

38,605. How many years ago?—I think they started in 1914 or 1915; we paid the bills.

38,606. Have you got a copy of that bill?—It cost us about Rs.20,000.

38,607. Is that including the engine?—No, the engine and pump were separate.

38,608. What size tube well was it?—It was about 10 inches; we were never able to use the pump they gave us on that tube well.

38,609. How deep did it go?—188 feet from ground level.

38,610. And it cost you Rs.20,000 without the engine?—Yes; I am speaking from memory. I know we spent altogether, including the Government grant, over Rs.70,000 trying to get water for our place. We had one try to get it from the river Jumna; that is what the big bund represents, that is there going down to the river with trees on it. The river cut in and took 400 feet of 10-inch pipe away from us one year. So we gave up trying the river.

38,611. Could not you pump from the river?—We accepted advice from the Government Engineer; he was the only man who seemed to know anything at that time.

38,612. You could not see your way to pump from the river?—We did try; including the pump and engine we spent about Rs.50,000 in trying to pump from the river. The Allahabad Municipality also has trouble with the water works owing to the vagaries of the Jumna river cutting in and

swinging from one side of its bed to the other. It would bankrupt anybody but a railway to get their supply of water from the Jumna river in the way the East Indian Railway gets it.

38,613. Are you now using all the sullage water of Allahabad?—No, we are only using two lakhs of gallons a day; about a million gallons is running into the river.

38,614. Even now?—Yes.

38,615. Why cannot you use the whole of it?—We cannot get land to put it on. A gentleman in America gave me 50,000 dollars for the purchase of land; I asked Government to help us; they told us to try and buy land by private treaty. I was very fortunate in being able to buy a village by private treaty. Then I asked the local authorities to help us to get the next village so that we should have another 400 acres for sullage water, which would have taken most of that million gallons, and I was prepared to pay the Municipality for it.

38,616. Do you pay anything now?—We pay Rs.4,000 for a lakh of gallons per day per year. When we had bought the village on the advice of the Government by private treaty, I then asked Government if they would secure the cultivation rights, so that we could square and level up the land and get the sullage water on to it. I was informed that by law as zamindars they could not acquire the cultivating rights for us; and so for six years we have had that land unable to do anything. Then with regard to this village of 400 acres that we wished to get, there was a little squabble in the Municipality, and it ended in a sort of faction. It was owned by Mohammedans, and we wanted to get the land to put sullage water on it. They knew the sullage water was flowing into the river; there was some communal difference so that we were prevented from getting the land, and I had to return 30,000 dollars to America, which rather hurt me, because we could have made such good use of it.

38,617. What do you mean by the cultivating rights? When you got the land could not you cultivate without reference to anyone?—The zamindars own the land, but the tenants have inalienable rights to occupy and cultivate.

38,618. Occupancy rights?—Yes. The holdings of these tenants were all scattered, and I asked them to allow me to square up the land; I said: "You have got five acres scattered here; I will give you three acres in a solid block under sewage water which will make you rich if you work it in the right way"; but they were not willing, they were so afraid that I wanted to trick them and could not understand that I wanted to benefit them.

38,619. You are now paying Rs.4,000 to the Municipality?—Rs.4,000 per year for a supply of one lakh gallons per day; we are paying them Rs.8,000 per year; we are getting only two lakhs of gallons, because that is all the land we have got to put it on.

38,620. What is the total discharge of that sullage water?—I am not quite sure; according to the latest figures I had they were getting from 15 to 18 lakhs of gallons a day; when the whole scheme is complete they will have 35 lakhs of gallons per day; they have only got 120 acres on their own sewage farm. They had only 80 acres until I pointed out to them how they could get more. They were only getting Rs.10 an acre for their water; I showed them how they could get Rs.200. The rest of it goes into the river just where the pilgrims bathe.

38,621. Does no one object?—They have objections nearly enough to fill this room, but they do nothing.

38,622. We were told yesterday by Dr. Fowler that you could convert that sullage water into manure?—It is manure.

38,623. But it can be converted into solid manure?—But this is surely the cheapest and most economical way of disposing of it.

38,624. But instead of allowing it to go into the river, could not you make use of it in that way?—By drying out the sludge?

38,625. Yes?—It could be done, but it would be at a very much greater expense; and, remember, it is not my water; it is the Municipality's.

38,626. Could you consult Dr. Fowler and advise the Municipality to set up works? I should say it was a heinous crime to contaminate the water?—It is.

38,627. Because a lot of people down below must be using that water for drinking purposes?—I, myself, think it is almost verging on the criminal. There was an outbreak of typhoid. When the Municipality were cleaning their engines, their outlet for the sewage was about 150 yards above the intake for the East Indian Railway; they let the sewage into the water and the railway was pumping it up for railway use. I saw a Scotchman who had just put his two little boys in the cemetery; had I been in his place I should have had something to say to that Municipality. There was a serious outbreak of typhoid resulting in several deaths, and that stuff is still going into the river; it is a disgrace; the land is there, and there are people who are willing to use it, but the work is blocked.

38,628. For some time you have been using the tube wells?—Yes.

38,629. You said the cost was 2 to 4 annas per thousand gallons; that is an enormous figure; is it correct?—That is what it cost us.

38,630. Do you now use sullage water?—Yes.

38,631. Do you dilute it with fresh water?—No.

38,632. You use it as it is?—Yes; of course, we divide our farm; there is a certain part of it where the sullage water never has been and never will go. The reason I took that sullage water was that under the terms on which we got the land the Municipality had the right to take our land at any time they wanted it, and they proposed to take it and bring the main sewage pipe right next door to our dairy and hostel. That would not have been pleasant for our students and our bungalows, so to protect ourselves we went into this sullage water business.

38,633. I think there must be some mistake in your calculation, because even at 2 annas, not taking the higher figure that you mentioned, for one watering over one acre it would cost Rs.37?—Tube-well irrigation is very expensive; that is what it actually cost us. Those figures were taken some years ago.

38,634. You are putting it on the land without diluting it; if I may say so, I think that is a mistake?—Perhaps you are confusing two different things. Sewage-water irrigation is one thing; for that we pay Rs.4,000 a year for 100,000 gallons a day per year; we have to take it every day that the pumps are working. The other is pumping clean water from a tube well. It varies according to different conditions; it may be from 2 to 4 annas per thousand gallons of water pumped, and this makes it very expensive for irrigation. But what does it cost with bullocks? It costs nothing like that; a pair of bullocks from a Persian wheel lifts up 2,000 gallons an hour easily and works for eight hours, the cost working out to about 1 rupee or Rs.1-8-0 a day.

38,635.—*Sir Thomas Middleton*: I think you have given a good deal of attention to the cattle question in India?—Yes.

38,636. You know that there are two schools of opinion, and, as a matter of fact, you mention it in your memorandum: one, that we have too many cattle, and the other, that we have too few. What is your view upon that

question?—I agree in a way with both schools of thought, because we have too many of the wrong kind of cattle and too few of the right kind. But looking at the question from the economic point of view I think it is undoubtedly true that there are far too many cattle for the needs of the country.

38,637. I think you made an estimate of the number of plough bullocks in India, did you not?—No; I took the figures from the Government reports. Of the 146 million bovine cattle in British India in 1919-20 presumably 73 million are males and 73 million females.

38,638. And you worked the figure out to something like one plough bullock to five acres?—That was arrived at after consultation with a number of friends at the meeting of the Board of Agriculture. Of course, in some parts of India it is much too high and in other parts it is much too low. A good deal depends on the size of your cattle and the kind of land. I discussed it with a number of friends and we thought that that figure was very near the actual figure for Allahabad.

38,639. I wanted to get at the source of that particular calculation. If you were asked what a good pair of bullocks could cultivate in your own neighbourhood, what would you expect of them?—We do all our cultivation without any tractors and most of our land now is bearing two crops a year; and we average one pair of oxen to 20 acres; of course, they are working practically every day.

38,640. Would you be kind enough to let us know how you arrive at the cost of labour of oxen in the case of summer ploughing referred to in the statement of cost of cultivation you have supplied to us? What do they cost you to keep?—For the amount of food consumed we issue a regular ration; there is the cost of food, then there are two men in the barn who are supposed to keep the barn clean and to put the food in the manger and clean the oxen. We reckon that it costs us from 8 to 10 annas a day to keep our oxen in good condition.

38,641. I would be very much obliged if you could let me have the details of that calculation. The cost will naturally vary at different times in the year and you have no doubt adopted here a round figure?—No; it is the actual amount of ground ploughed in the hot weather. I think we put four pairs of oxen on a disc plough which goes anywhere from 8 inches to a foot deep when the ground is very hard; and the oxen in the hot weather work for not more than seven hours a day. I can send to the Commission the detalis of this calculation.

38,642. What I am anxious to get at is how much it costs to maintain cattle that are doing the work you describe? It is hard work in the summer as you point out?—I can send the details to you. I will make a note of that and let you have the information in due course.†

38,643. Have you ever tried to estimate what your neighbours or other villagers expend on their bullocks, or what their bullocks cost them to keep?—I have very frequently talked it over with them. When the bullocks are working they give them perhaps a seer (that is, 2 lbs.) of grain and 2 lbs. of cake a day, and they chop the fodder by hand. A very interesting fact has emerged; now that we are selling silage at 8 annas a maund a great many of our neighbours in the villages who keep bullocks come and buy our silage to feed their bullocks and they are willing to pay us 8 annas a maund. We are carrying on quite a good trade in that line. They save themselves the trouble of having to cut it, and there is the palatability of silage which the cattle like. But a lot of those village oxen are not working on the ground more than 45 to 50 days in the year and when they are not so working they are turned out very largely to fend for themselves along the paths between the fields and along the roadsides, as a result of which they live

† Not printed.

a life of semi-starvation. And here I think there is ample room for the Society for the Prevention of Cruelty to Animals in India. The way that they are turned out is disgraceful with no proper amount of food given to them.

38,644. So that the actual cost to the cultivator in different districts must vary very widely?—Yes.

38,645. Generally speaking, have you noticed that in districts where cotton is grown, the bullocks are better kept than in other districts? Is that the case in these Provinces?—Of course cotton seed is a very good bullock food. I had not thought of that. I have noticed as I have gone about India that in different tracts you get a different size of animal. I think you will see that the biggest boned animal almost invariably comes from the desert while your smallest boned animal comes from tracts where you have a very heavy rainfall and a great deal of vegetation. For instance, in Bengal your cattle and men are small compared with the Punjab where you get both big cattle and big men. And I have also noticed that where Government have at various times put down their breeding studs for horses and mules and so on, in some places no matter what they start with, they get a small animal. It is just the same in Europe and America; in North Wales for instance you get a small bone; and the same is the case on Exmoor.

38,646. You are thinking now of sheep, and not of men?—The men too, small, that is, from the chin down.

38,647. To pass to another subject, you mention the great use that Canada has made of its schools? Has your attention been drawn to the use they have made of their school children in distributing pure seed?—Yes, it all went with their system. The school was a distributing agency for better seed.

38,648. Do you think that it would be possible to use Indian boys in the same way that Canadian boys are used to get pure seed distributed?—Yes, I do. Sir Selwyn Fremantle when he was Collector of Allahabad actually began it. He was so keen on this that he gave to every rural school a plot of ground with a well and a fence; he sent his teachers for training, and he procured better seed and better implements, and altogether I must say that he was making real progress until he was transferred and there was no more interest evinced in this. That is one of the difficulties in India. Instead of his being promoted to Lucknow, if he had been allowed to stick at that one job and work it through I think myself that he would have made a real contribution to India greater than he made after his transfer, an advantage which was lost because his successor was interested in other things which may have been just as valuable. But there is no doubt that one tragedy of India is these half-completed, broken-off schemes which you see everywhere. That is why we, if I might say so, promise more of continuity at our one job than Government.

38,649. To pass from Canada to the Southern States: is it not the case there that great use has been made of the boys' clubs?—Yes, boys' and girls' clubs.

38,650. That is under the States Relations branch of the Federal Department?—Yes.

38,651. Do you know whether the school plot is used in the Southern States for any other purpose than that of habituating boys to farming operations? Is it used as a means of general education? I have heard that it has been used to teach boys arithmetic and figuring up accounts?—Yes, the boy learns that; he knows what he is doing. He does the whole thing himself and knows exactly what he has done, how much time he gave to it, what the cost was, and so on. I think that is one of the finest educational methods ever devised.

38,652. And the system of education has been devised especially in view of the conditions prevailing in the Southern States?—Yes; of course, the same thing has been done in the Moga School in the Punjab. Then there is also a school at Moradabad under Canon Crosthwaite where something of the same kind is being done with village boys.

38,653. Then you remark that Indians must have the same chance of technical training as has been given in America and in other countries. When did America begin to give its technical training in Agriculture? Was there anything much done before 1864-65?—(*Professor Gangulee*): It began with the Hatch Act, I suppose?

38,654. *Sir Thomas Middleton*: No; it began with the land grant colleges. The point is this, the land grant colleges were started about 1864, and the Hatch Act came along in 1888. Was any considerable progress made in that period?—It is a very long time since I studied that, but if I remember aright there had been very little progress made in those years.

38,655. Practically none?—Yes.

38,656. The Hatch Act introduced the experimental station?—Yes.

38,657. And also research?—Yes.

38,658. And after the Hatch Act had been at work for some years then agricultural education got a real start?—Yes.

Professor Gangulee: Not until the Smith-Lever Act came into operation in 1914.

38,659. *Sir Thomas Middleton*: So that the movement became active from the time that the Hatch Act was passed. There was a period during which the American teacher was gaining experience and technical knowledge for himself, and it was only after he had got that technical experience that he was able to teach effectively, and your institutions have really become effective teaching institutions in the present century?—Yes.

38,660. And India is now passing through a similar period?—Yes.

38,661. But in its development it is a certain number of years behind the United States?—Yes, I should think it is ten or fifteen years behind the United States.

38,662. Would you agree that, before we are able to give the Indian the training which has been provided in the United States for its own subjects, we must have a well-developed system of investigation?—Certainly; and the encouraging thing about it is this, that the small amount that has already been done has produced marvellous results. Take the results at Pusa up to date, and also the results here in Cawnpore. The results are filtering down to the cultivator who is ready to-day to accept things that he would not have accepted ten years ago. The problem now is to take these results and place them before the farmer in the villages, and to get him to follow these improved methods.

38,663. You say on page 541, "The modification in the existing courses of study which appear to be called for is to make them less technical and scientific and more practical"?—Yes, the tendency nowadays is to turn out men who simply obtain a theoretical knowledge of agriculture, men who are very brilliant in the laboratory, who might be called stars, but in the actual field they would not know how to use a plough.

38,664. I quite agree with you there. What I want to put to you is this, whether, while the courses for ordinary students must be practical in character, the teachers who give instruction must themselves have had a very full training, just such training as your American teachers now get in American institutions?—Surely: the simplest village education will prove a tax on the best trained man in India.

38,665. How long do you take to train your teachers in the United States for work in agricultural colleges at the present time?—Very few teach with less than seven years of undergraduate and post-graduate training. You may get a man taking on a job as an instructor during his degree course in order to earn a little money, but there are very few men of this type who do not go on and take the Doctorate. The agricultural college teachers generally have four years of undergraduate training and almost invariably three years of post-graduate training.

38,666. On page 543 of your memorandum you say "The agricultural literature costs too much. The price should be nominal, or be given free upon request." I think in making that suggestion you are advocating the policy which has been adopted in the United State?—And Canada. I think Canada is more generous with this literature than the United States. I say it should be free on request. I do not mean to say that this literature should be published just for the sake of the department and then used in the bazaar for wrapping up sugar and tea. For instance, I want certain things on dairying; it is impossible to-day to gather a library of Government publications on dairying in India. Anything that is good is mostly out of print. Once I sent for a book and I had to pay Rs.6. I think a mistake was made because on the publication itself, a leaflet on the milk problem of Bombay, the published price was 3 annas, but that cost me Rs.6-14-0*. Suppose there is a young graduate from this dairy training school who wants to start a dairy somewhere and he wants to get everything that is published in India on the subject, it is difficult for him to get it. The books may be out of print or the expense may be out of proportion.

38,667. And sometimes a great deal of labour is taken in preparing leaflets for publication but they do not reach the people they are meant to assist?—Yes, they do not reach the people. I think every University library and every school library in the rural areas should have all such agricultural publications and there ought to be a trained librarian who could point out to the students and talk of things when they come in; there is very little done at present in this way to stimulate interest.

38,668. You point out the way in which the Meteorological Department fails to meet your needs. For example you say they do not give frost warnings as they do in America?—Yes.

38,669. My point is, do you think if our Meteorological Department in India undertook to give frost warnings there would be any chance of adopting the methods which are commonly adopted in the United States for combating frost?—Yes; such a warning should be put up at every school house or any other public place and the farmers would get to know it as they pass along. If the village farmer knew the frost was coming he would irrigate or smudge fire; but he does not know when the thing is coming.

38,670. You think cultivators would smudge?—Indeed I do. If they were told about it they would smudge in the four corners of the fields or in the *arhar* patches; I think very little teaching would be necessary for that; once they grasp it they would take advantage of it.

38,671. *Raja Sir Rampal Singh*: On page 541, in your scheme of agricultural education you suggest that "there should be in every district a centralised school with a farm to which the best of the boys should go at the age of about 14 and stay until they are ready to enter college or go to work to earn their living." In what language should the training be given to these boys in the centralised school?—In the local vernacular.

* The witness subsequently received a refund of *Rs.6* from the Post Office.

38,672. In the college which you have in view should the education be in the vernacular or in English?—That would be for the educational authorities to say. In India, I take it that in the college there should be teaching in English; the Indians themselves want it. Most of the Indians of my acquaintance regard any system of higher education that does not teach English as walking up a blind alley. I take it that in the centralised school the instruction in farming matters would be given in a language that the boys could understand, but as preparatory to college I take it that English would be one of the subjects taught. That is why I speak of the centralised school; the small village school could not prepare for the college. But in schools where you could get the best boys you could concentrate on good teachers and you could put in a Professor of English.

38,673. With regard to propaganda you say that literature on agriculture should be free. Is there any literature in the vernacular of the Province which could be helpful to the agriculturist in making agricultural progress? Is there any such literature in the shape of books or journals or anything else issued by the Agricultural Department in the vernacular?—I believe there is. There are some medical books on sanitation; and I think there are instructions in the vernacular for the growing of certain crops, I am not absolutely sure about that. But if there are not any in the United Provinces Government, there are in other Local Governments and in some of the Indian States. I was thinking there not only of literature in English for the educated man but I was thinking of a pamphlet which could be read aloud by the schoolmasters to the farmers. I do feel that we are not having any good literature in the vernacular for farmers for instruction in various farm matters. I am in favour of a good deal more than we are doing at present.

38,674. There is a lack of such literature in this Province as far as I know. You say on page 540: "The great difficulty with most education given in Indian rural schools is that it has been prepared for the city boy"?—That is my experience. Not only that, the teacher in these village schools is often very proud that he cannot distinguish one crop from another when he sees it in the field. I have gone to some of the village schools in the United Provinces and asked a teacher what a certain crop was and he did not know what it was and seemed proud of his ignorance. What kind of teacher is that for a rural school? The whole bias of the man and the background of his mind is against what the boy ought to be learning.

38,675. So in order to bring about some improvement it will be necessary to recruit teachers from agricultural classes who may be in touch with the rural life?—If you cannot get agricultural classes to be educated I do not care what class he is from if he knows agriculture and loves it and likes to teach it; that is my point. Sometimes the agricultural classes have a very strong determination not to be educated and you cannot force those people into the schools to get training. But I do not care what class he comes from if the teacher is properly trained in agriculture and properly trained to teach it and that man would be better than the present average man in the village school.

38,676. What is your opinion about this Agricultural College at Cawnpore? Does it turn out persons who could take up farming?—I think it is very much better than it was; I think it is working towards that, but it was not started with that idea in mind. It was started as a departmental institution; it had no relation with the Education Department; but I think it should be turned into a first class agricultural college properly equipped and staffed for degree work. Now there has been a talk; some of the officials very high in Government service say that there is no room in this Province for two agricultural colleges offering degree courses. I have never heard of anything more preposterous than that, that two colleges are too much for 50 million people where a majority are farmers. There

is room for two, and if both are doing their best they are bound to stimulate each other. The trouble in most of the Government institutions is that there has been no competition at all. The staff could loaf on the job and there is no way of dispensing with them; if there are two institutions, there is room for both to do their best.

38,677. You told us that you were not getting any aid from the Government; did you apply for that?—No; I did not. The Mission under which I was working refused to accept any grant from Government because of the conscience clause; but there has been a recrganisation of the Agricultural College, and at the last meeting of the Board of Directors I was authorised to apply to the Government, and I am now asking for a grant. I am about to ask a lakh a year for three years non-recurring for our intermediate and dairy courses. If we become related to the University I am asking the University to give 2 lakhs non-recurring for hostel, laboratory and equipment, also the Government to give us Rs.25,000 a year to help us to pay our Indian staff for the Intermediate College and the University again to pay us Rs.45,000 a year for the degree courses. We to-day are putting about a lakh and a half of rupees annually into it from America. Our total contribution from America is about 15 lakhs pledged or paid in.

38,678. *Sir James MacKenna*: Where do you recruit your students from for your institute?—They come from different Provinces; we have got a good many Punjabis; the dairy course attracts them from all over India. We have had a number of students from Fiji Islands; we got them because the English Wesleyan Missionaries sent them here. They sent six boys, and most of them did remarkably well.

38,679. Are they limited to the members of the Mission or is it open to the general public?—The majority of our students are non-Christian. We never make any difference.

38,680. It is an open institution?—It is an absolutely open institution.

38,681. Have you any organisation for demonstration?—No; we have very little; it takes men and it requires money. We are concentrating on meeting the requirements of the educational authorities; it is our primary business to teach; but in the next few years we do hope to build up an Extension Department as we call it; for instance, we have just been asked by local fairs to send cattle and ploughs and other machinery and demonstrate, and we have had to refuse because we had sent out all we could spare of things and cattle down to the *magh mela* exhibit; that was held in conjunction with the Allahabad District Board and the Local Government Department of Agriculture. The *magh mela* is one of the most profitable places for doing it. A great number of people came there; the Government put up a sugar making demonstration; our Agricultural Institute put on the dairy side of it, making butter and *ghi*, and churning and so on, and sent our best Jersey and Brown Swiss bulls. I wish we were in a position to respond to the invitations we get; but unfortunately through no lack of willingness but owing to lack of finance and staff we cannot do much. You cannot get a man out from America nor can you take an Indian and send him, without any training, to give a demonstration. He has to undergo years of apprenticeship and preparation. I think a man to be successful in this field should have a longer apprenticeship than a doctor even.

38,682. If you have a demonstration *vis a vis* the local department there will have to be some working agreement?—Yes.

38,683. For defining areas probably?—I have not taken that matter up yet. There is another thing; we are invited from outside the United Provinces.

38,684. You do not anticipate any difficulty in setting up an organisation when you are ready to demonstrate?—No; there has always been the heartiest

co-operation with Government; I do not anticipate any difficulty; they are just as keen on it as we are, but very frequently they are hampered in much the same way as we are; we both recognise that it is a good thing, but we cannot do all we would like owing to limitation of resources.

38,685. Do you think you are having any more success than Government in getting students to come to you who want to study agriculture with a view to going back to the land, or do you find that the bulk of the students want Government jobs?—I think we have an advantage in some ways over Government; if a man wants a Government job he usually goes to a Government college, because our students, rightly or wrongly, have an idea that if they are trained with us they are not as welcome in Government jobs as they would be if they went to a Government college, so that I think we get more of our men looking to other than Government posts. But that is nothing to our credit; if they thought there was a better chance of a Government job with us than in a Government college, they would flock to us.

38,686. *The Chairman*: Very few of the students shown in this list appear to have gone back to the land?—Several Missions want to start agricultural training and teaching, and they use our men. We have a Medical Missionary who has taken a survey or all our orphanages and schools, and he finds that every child under 10 is under weight and under-sized, suffering from malnutrition, while the children over 12 are all up to weight. He being a medical man, says that this uniformity of under-weight below a certain age points to the fact that these children are being fed on an adult diet. So he started a programme among the Mission schools and orphanages for what he called: "More cows and cabbages." The result is that many of the schools have put in gardens and cattle to provide the children with fresh vegetables and milk, and use the men trained by us. A great many of our people are working on the land for Missions and teaching in that position. That is what I meant when I said that in the early part of this training most of the men will go into teaching positions, and later on they will go back to the land; we are merely repeating the experience of Canada and the United States in that respect.

38,687. *Sir James MacKenna*: In reply to Sir Henry Lawrence, you pointed out the great difficulty of getting adequately trained Indians for the posts you are trying to fill in India. Have you ever considered the possibility of developing Pusa as a higher training institution?—Yes, it ought to be. I have been to Pusa a number of times. Our difficulty is that, if a man has been to Pusa, he is not willing to work on the salary we can offer him; we live on a missionary salary and we are not likely to appoint people on double the salary we are receiving.

38,688. But apart from that difficulty peculiar to the Mission, do you think Pusa should be developed as a post-graduate teaching institute of a high standard?—Yes, except that it will not be enough for the whole of India. Everyone of the present colleges should be developed for post-graduate work.

38,689. What is your general view of the efficiency of Pusa? You have visited it frequently, I know. What is your view of the work done at Pusa?—I was invited by the Agricultural Department of the University of California to make a statement; they welcomed me as coming from India, and I said something about the great outturn of high grade work from Pusa coming from such a small body of men. The Dean of that College, which is one of the greatest agricultural colleges in America. said: "I bear out Mr. Higginbottom; he is not exaggerating; we regard the Pusa bulletins as among the best that come to us." I frequently had luncheon with members of the agricultural faculties in America, and they all seemed to have a very high regard for the research work that was done at Pusa and in India generally by the Agricultural Department:

in plant breeding, Howard's work, Hutchinson's work especially, Dr. Barber's work on sugarcane, and the work of Lefroy when he was at Pusa. These and other men and their work are very well known in America.

38,690. So that Pusa has no cause to be ashamed?—No cause to be ashamed at all.

38,691. What do you think of the Board of Agriculture? You frequently honour us with your presence?—I think it is a most useful body doing most useful work. It is a piece of propaganda, but it is more than that. A great danger in India for scientific workers is that of isolation. I always find that I am well paid for attending these Board meetings, not merely by what I get in the formal meetings, valuable as that is, but also from talking quietly with the men who are working on the same problems that I am. It is the informal discussion among these men when they get together for a number of days that is the Board's most valuable contribution.

38,692. Have you attended any of the sectional meetings that used to take place; that is, meetings of Botanists, Chemists and Entomologists?—I have only attended the sectional meeting on cattle.

38,693. Do you think it is a good development for the Board to work in smaller units on particular subjects?—Yes, I do, though I think you need both.

38,694. One could supplement the other?—Yes.

38,695. Sir Henry Lawrence put to you a question about non-American scientific workers in American Universities, and you could quote one instance from Canada. Is it not the case that in another branch of science, theological science, there is a very considerable importation from my country?—Yes; my own University has had half a dozen; Mr. Bowman has just returned to Scotland after teaching in Princeton for a number of years; there is also Professor Thompson. America has had a number of Oxford, Cambridge and Edinburgh men. In other than agricultural fields American Universities draw very largely on foreign countries. I know of Indians teaching in American colleges.

38,696. I think Sir Henry was asking about that general principle, that in getting men in any branch of science America takes the international view?—Yes, that is so. You would have difficulty in finding a large American University that was staffed only by Americans; there are men from France, Germany and Austria: in fact, men of all nationalities. The American Universities are looking for the best, and they do not care much what country they have to go to if they can get the man they want.

38,697. Have you had any direct assistance in the development of your Institute from the Imperial departments in regard to cattle breeding, dairying, improvement of crops and so on?—We have had no financial assistance; we have had their advice in a number of things.

38,698. I think you consult them freely?—Yes, I have never hesitated to consult them.

38,699. Has the Imperial Department been a distinct help?—Yes, it has to us. Then, of course, we read all their publications; this latest report from Pusa on their work on sugar immediately interests us. I may say it has led to the writing of several supplementary letters because that report was not full enough to meet what we wanted, but it told us where we could find what we wanted, which was an important thing; we knew we could get it at Pusa.

38,700. You have probably been following the evidence that has been given to this Commission and may have noticed under discussion the idea

of a Central Agricultural Board assisting the research in the Provinces. There was a leading article in *The Pioneer* some weeks ago on that subject?—Yes.

38,701. Have you considered the advisability of a scheme of that kind? —I have not only thought about it, but some years ago I wrote to the Agricultural Adviser at Pusa urging the necessity for some such thing to act as a co-ordinating and distributing agency; it would have two functions.

38,702. Is the central body to have a staff of its own available for particular work in a Province?—I find a difficulty in going into details; I think it has to be worked out as it goes along. It may be I am an opportunist in my philosophy. I cannot lay down all the details, but we need the men and we need such a body; we have not got it to-day. A man may be working in isolation not knowing what another man is doing and he may waste years of his life; whereas if there were this co-ordination and distributing body he could get the information he wanted and save public time and money.

38,703. I know you have been interested in economic questions for many years; have you any idea how we are eventually going to get down to the small cultivator, the one-yoke man? The Agricultural Department is rather apt to look after the big man, but the man we must eventually get to is the small man?—We must use the village school and demonstrate in the village where he lives. The report of the General Education Board of the Rockefeller Foundation is the thing to follow; it has succeeded marvellously. The late Maharajah of Gwalior had adopted that system. Sir Selwyn Fremantle had started it in the Allahabad District. If we continue that system for a few years, I think you will find we shall get down to the small man. When you get down to him, you will find that your problems are not problems of agriculture; they are the problems of protecting him from illegal exactions of all kinds and securing to him the due reward for his toil. Before I left I said to the Maharajah of Gwalior: "You have got good land, you can grow as good things here as in any place on earth, and yet 650,000 acres of your land, which is as good land as God ever put anywhere, is lying fallow because no man who goes on to it has any security." Of course, we get back to a moral issue, right between man and man.

38,704. *Professor Gangulee:* On the question of co-operation between the Imperial and the provincial research departments, I think in answer to the Chairman you referred to the Smith-Hughes Act of 1917 in your country. What is the chief object of that Act?—I am afraid it is a good many years since I looked it up. Generally, as I understand it, it was to provide demonstrators to go into villages where it was felt that they needed agricultural betterment; it was for the adult farmer, for the man actually face to face with his problems.

38,705. The chief object, I think, was to give a federal stimulus to the different States?—Yes, but for a particular object.

38,706. I think you have a special bureau called the States Relations Service?—I am afraid I have not studied these things for a long time and my mind is hazy on them.

38,707. That Service, I understand from a note given to us, was a connecting link between the Central Government and the States; do you think such an organisation is feasible in our conditions in India?—Yes, I think it is not only feasible, but we ought to have it.

38,708. In your note under the heading of research you seem to suggest that sufficient official encouragement was not forthcoming?—I hope I did more than suggest. Where are some of the best men in India to-day? Why did India let Lefroy go? Why did India let its best men go? They went

elsewhere for better pay; you cannot blame those men. There is another thing: I know there are great and fine lawyers; I have nothing against the legal profession as such, but frequently when the Agricultural Department has made requests I have known these men holding office to say: "I know nothing about what you need for agriculture, but I know I will not give it." When a great public department is face to face with that attitude on the part of its officials at the top, what can the department do? You break the hearts of your best men, whether they are Indians or British, by asking them to work bare handed.

38,709. You say you are not in favour of veterinarians having charge of animal breeding in India. Can you tell us what is your reason for saying that?—Well, they made such a mess of it. I would have the animal breeding in charge of an animal husbandry man. You do not get a veterinary surgeon to breed your racehorses in England. For instance, in these Provinces a few years ago the Government were advocating a certain breed of cattle, the Kheri cattle. I do not believe any female of that breed was ever known to give a calf before it was five years of age, and the bulls were not mature until they were six. Who wants to keep an animal five or six years before it begins to give any return? The veterinarian had chosen this animal because it came nearer to subsisting on nothing than any other animal in the Provinces, which means that it was furthest removed from domestication; it had less qualities desired by man than any other breed of animal in these Provinces, but, because it could survive when everything else died in a famine, it was chosen. That is the sort of thing I have found likely to happen. The veterinarian has an entirely different object from that of the animal breeder. I want a cow that will give a lot of milk, and I am ready to protect that cow while she gives it; I want a bullock that can work, and I am willing to protect him. That is what I mean by domestication.

38,710. You refer to the demonstration work done in the southern part of the United States; I think you are referring to Dr. Knapp's work?—He was the beginner.

38,711. Do you think that method of demonstration could be adopted in this country?—Yes, it was the object of the late Maharajah of Gwalior to adopt that method in his State.

38,712. Are you familiar with the methods of demonstration adopted in the United Provinces?—I am sorry to say, not recently; I have just returned from furlough; they were opening demonstration farms.

38,713. You have been in this Province for twenty years?—Yes.

38,714. You know something of the methods adopted?—I know some of their methods; they vary very much. It is the personal element that counts. I know men in these Provinces who have done splendid work, of which any Government department might well be proud; I know other men of whom it may be said that it would have been a good thing for everybody if they had retired young.

38,715. Are you in favour of demonstration on the farmer's own land or on demonstration farms?—You need both. From the demonstration farm you must be able to guarantee a supply of pure seed, and then from that demonstration farm have your staff going out into selected villages where farmers on their own land try to repeat those demonstrations. But in India especially, more than in America, I think the demonstration farm is necessary and is very useful if it is managed in the right manner with the right man at the head of it.

38,716. Would you attempt to run demonstration farms on economic lines?—What do you mean when you ask that the farms must be run on economic lines?

38,716A. They must be self-supporting; they must pay for themselves. I use the word economic in its real economic sense.—I do not mean that they should make a profit. I mean that they should be run economically, with the best book-keeping methods.

38,717. We were told that most demonstration farms in the Province were paying?—Then I doubt their value and I doubt their book-keeping too.

38,718. In the United States there are a number of County Agents who are entrusted with the duties of demonstration and distribution of literature and of things that concern the welfare of rural population. Do you think that in this country there are possibilities of having such men?—I do: that is part of the scheme surely.

38,719. Men of what calibre would you have for such work? Men well trained in agricultural colleges?—Certainly; not your recent graduates. The man must have had anywhere between five and ten years of experience. It would be an awful thing to send a recent graduate to try his mistakes on the poor villagers in the countryside.

38,720. You would have, first of all, a man who was trained in an agricultural college; then you would have such a man who had had five to ten years' experience?—Yes, possibly teaching on one of your demonstration farms or in the college; but only a man of approved fitness.

38,721. What would be his duties?—He would have to cover the whole field of rural life; it is the man we want to improve. We know of course that we cannot improve him unless we can give him a bellyful of good food once in a while.

38,722. I think you have in the United States of America a service called the Rural Service? Do you think you can have such a Service in this country, a service from which you recruit your county Agents?—That really embraces the whole field of rural life; it is really too big a job for any one man to be able to advise one fellow on the best kind of beef cattle and another on dairy cattle, and all crops on all soils; but get your one man going first and then follow the light of experience.

38,723. I have one or two questions to ask you with regard to your Institute. When you say that there is no definite, well thought-out programme for rural education, do you mean to suggest that hitherto in India we have not had any definite scheme drafted?—I have seen lots of schemes, but I have never seen one that worked out according to the way in which the man who designed it intended it to be worked. I know that Dr. Mann has a school, and I also know that there is a school at Bulandshahr, but the men in charge at those schools do not claim that they are doing what they ought really to do.

38,724. Have you visited the Bulandshahr School?—Not recently; four years ago.

38,725. Would you attempt to teach agriculture in primary schools?—How are you going to define agriculture if you mean to give each child its own garden plot as they have done in the Phillipine Islands? Of what age are your primary school children?

38,726. In this country they are from seven to eleven years of age?—At home such children would help the *chaukidari* and collect fuel and do things of that sort. They might learn things in the garden; but to say to teach formal agriculture, you need a little elasticity there.

38,727. Your success in the southern part of your States is chiefly in your secondary rural schools, and not so much in your primary schools, I take it?—They were children who did not get to the primary school stage till they were nine or ten years of age.

38,728. Do you think that there is a demand for special agricultural schools in this Province? You have one such school at Bulandshahr?—

I do not know that there is a demand, nor do I know that there was a demand for them. But I know they are needed.

38,729. Then would you have agriculture taught in the ordinary middle schools? Is that your idea?—I would have agriculture taught in every rural school in the Province. I know that that is a counsel of perfection now because you have not got the teachers, but that is the ideal at which I would aim. In every rural school I would introduce the school garden scheme which Sir Selwyn Fremantle evolved.

38,730. In your own institute work, in your teaching work there, do you use the results obtained by Government farms and stations in this country? —When I have been asked what we are doing there I say that we are teaching agriculture and demonstrating. We do not have the equipment for experiments, and anything in the nature of experiments is a side-issue with us. We do definitely set out to know the best that the department has found out from its experiments and we teach that.

38,731. Do you charge any fees from the students?—Yes; for the diploma course the fees are Rs.10; for the other courses the fees as Rs.6.

38,732. What salaries do you give your teachers?—The Missionaries are all under a missionary allowance. Then there are Indians who are not being paid quite as much as I would wish. Mr. Mulchand is getting Rs.2040 a year; Mr. Halder, Rs.1800; one gentleman is getting Rs.2325, and Mr. Sud is getting Rs.1720. But these men are not getting the salaries which the Government institutions would pay. I wish we were in a position to pay them more.

38,733. You refer to the agricultural literature that is produced in this country. What is your view on the quality of the literature that is produced?—It is valuable; some of it is very good indeed.

38,734. I am not referring to the Imperial literature, but to the Provincial publications?—Yes, I say that some of it is very good. I do not, of course, know very much about all of it.

38,735. Your Institute is not affiliated to the Allahabad University?—No; but I hope it will be. It is teaching a course now under the Board of High School and Intermediate Education. It was a fight of years to prove to the educational authorities that agriculture was at least not negative educationally.

38,736. You told us here in this note that the Government Military dairy farms could be used as educational institutions? Have you any definite idea or scheme as to how that could be done?—They are the best dairies in many ways in India. If they had the money and a degree of continuity they would do very well indeed. At Allahabad Major Meagher, who started it, built quarters for students and in the earlier days they did train some men who did very well. You could have two kinds of training; you could bring in ordinary *gowala* boys and give them a short course, showing them how to produce clean milk, how to feed their cattle economically and so forth; it would be strictly practical. And then again I think that every Government Military dairy in India should train ten students a year; this would be a very good thing indeed.

38,737. Regarding the question of rural education, you say that rural education in rural tracts can be popularised if it can be proved that it pays financially. I suppose you want rural schools to pay for themselves, to be self-supporting?—What I meant by that was that the boy who gets this education should be worth more in rupees than the boy who does not get it, and that has not yet been demonstrated.

38,738. In answer to Sir Henry Lawrence, I think you mentioned something about prisoners being trained in the jails. Do you know of any prisoner who, as a result of his training in the jail, has adopted any improved methods of agriculture after coming out of the jail?—I did know

a good number of them a few years ago who went out from the Naini jail and did this in their villages.

38,739. I saw Colonel Hudson's work in 1906-07, and my impression was that no systematic agricultural training was being given in his jail?—There was no continuity in the work; it was just Colonel Hudson's personal interest in such work, and of course you will agree that you do not find many Colonel Hudsons unfortunately.

38,740. Have you closely followed the research work of the Province?—I am now at a disadvantage in having very recently returned from furlough. But up to the time of going on furlough I did follow the research work of the Province. I felt that in Mr. Leake's work in cotton, Mr. Clark's work in sugarcane and Dr. Parr's work at Aligarh, that the Province had something of which it might very well be proud.

38,741. You have known the Province for twenty years, I believe. Do you observe any change in the standard of living amongst the cultivators and the people?—I think that they have a little more, but not very much.

38,742. You do not see a distinct rise in the standard of living?—Not very much. In the villages they still eat raw *bajra* and have a minimum of clothing.

38,743. Is that largely due to the enforced idleness of both man and beast?—I think so; they are in the long run paid an economic wage, and if they work only a third of their time they only get paid for a third of their time.

38,744. *Mr. Calvert*: You have seen Moga, I presume?—Yes.

38,745. Do you think very much of value could be learned at Moga by other parts of India?—I do: I do not say that Moga is perfect; it has got a lot to do yet, but, when I first saw and got acquainted with it, I thought it was a most valuable contribution to India at that time.

38,746. You put forward the suggestion of having a properly qualified teacher at every school, but in your teacher's course you do not, apparently, include co-operation?—In practice we do; I am very sorry if that is omitted: it is taught. No student gets out of our institution without some knowledge of co-operation. I think I have said in my evidence that this is the most valuable handmaid that we have.

38,747. Do you attach importance to inquiries into rural economics?—Very great importance, because, so far, we have been walking in the dark. When, at the Board of Agriculture meetings I talk about the conditions of the villages around Allahabad, for instance, the other men look at me in amazement; and then when they talk about conditions in their part of the country, round the villages, it causes me to look with amazement at them.

38,748. Do you think they might prove useful as guides in directing agricultural policy?—I think they are doing so. That is our greatest trouble; we know so little about village life, and if that were not the case we would not be having this Commission sitting here to-day and making inquiries into these matters.

38,749. We ourselves have not yet been able to get at the economic facts with regard to agricultural conditions in the Province. Have you noticed any lack or insufficiency of such knowledge among the officers of the Agricultural Department?—I am not sure of your question.

38,750. Have you found that officers of the Agricultural Department are somewhat lacking in knowledge of economic conditions?—Yes. They have been trained all on one side, and frequently it seems to me that they have had very little training in economics.

38,751. Do you think there is much scope for horticulture, fruit and vegetable growing in these Provinces?—Yes, there is very great scope. I believe that there are very great potentialities in this direction in India, and if the question is tackled in the right way there is great scope for displacing all the imported stuff. We have a veritable goldmine at our very feet here, but, unfortunately, we have not yet been shown how to exploit these resources. We have not studied the problem, and once we master it we can compete with the other fruit markets of the world. At present California and Florida are looked upon as the world's best fruit gardens. To my mind there are much the same possibilities in India. Take, for instance, the guava; the best guavas are to be got at Allahabad. Supposing you buy a dozen guavas from one dealer, the chances are that you will find almost a dozen different varieties among that lot, because they have never been sorted out. Then, again, I have eaten oranges in the Punjab which I considered were as good as those we get in Florida or California, the only places which can surpass them being Damascus and Palestine. As I say, we can grow marvellous varieties of fruit in India, but we know very little about fruit growing. We have not learned yet how to protect fruit against wild animals, nor against insects, and other diseases, so that as soon as they are attacked by any insect or fungus disease the whole lot of the trees and groves are in danger of being wiped out. We have a whole-time man from America on fruits and vegetables. So important do we regard it.

38,752. *Professor Gangulee*: You are paying more attention to guavas?—We are trying now to sort out the guava. Our man has several hundreds of seedling trees planted. He will sort out those trees and then he will choose the early maturing varieties, the late maturing varieties, and so on, for other desirable qualities and characters, and then will multiply them and establish a standard variety of guava, something that has not yet been done.

38,753. *Mr. Kamat*: We are told the demonstration farms in this Province are almost invariably self-supporting. As an experienced agriculturist, do you regard this as a sign of a sound policy and that there is no air of artificiality about it?—I have no way of going behind the records. I have just to take the things at their face value. I cannot say whether these demonstration farms are paying or not; I would have to study the accounts to see how the interest charges, depreciation and all those things are met. But I do not regard it as essential or desirable that a demonstration farm should be profitable. Its function is not that.

38,754. So that assuming that the Local Government have issued departmental orders that every demonstration farm must be self-supporting, that policy you would not regard as sound?—I should regard it as based upon ignorance.

38,755. *Professor Gangulee*: It was done by the Minister?—Supposing it is laid down that the public gardens in Allahabad must be self-supporting, how can they be? There are public gardens which used to be the most beautiful spots in Northern India; now the cows are grazing on them. It needs a little sense. If you simply say that a great public park should be self-supporting, how can it be self-supporting anywhere on the earth? There is a park in Allahabad and I used to go there with my family to hear the band on Saturday afternoons. They said that the gardens were kept mostly for Europeans. But by actual count on repeated Saturday afternoons I found that for every European or Anglo-Indian there used to be twenty Indians who were enjoying it. I used to go there for the beauty of the place and I gloried in the Indians' good sense in going there; but that day is gone because of the so-called but misnamed "economy."

38,756. *Mr. Kamat*: Now about the policy of these schools such as the one at Bulandshahr or the Agricultural College, your experience is that the courses in them are not practical?—There is an element of practicalness there, but we want more. True we have to pass the bar of the educationists. Teaching chemistry, they talk about "pure chemistry" and "pure science" and that sort of stuff. Now we farm teachers have got to give a man enough chemistry and enough biology and enough economics and so on to use in his every day farming. They are not ends with him; they are means, and we want to give him enough of those sciences so that he will understand the principles in all his work. But the main emphasis is on teaching him to grow crops for profit.

38,757. Exactly. You said that you were not quite sure whether Dr. Mann's syllabus was right or whether the Bulandshahr course was right. I would like to ask you, are you quite sure that on your own farm every boy turned out can make agriculture profitable as you say?—No. We are not teaching the course we would like to teach; we are not getting the whole loaf; we are getting half a loaf and we hope to get this agricultural course in the next few years to be the kind of course we want.

37,758. And you would solve that problem in the course of a couple of years?—I dare not be so optimistic.

38,759. Say five years more?—We hope to do it gradually, and that is one of the benefits of having Cawnpore working with us.

38,760. The question of time is not the essential thing?—No. We hope to get a course in agriculture so that the average graduate will do the job for which he is trained. It is not every man who goes through the law school that makes a successful lawyer, nor does every man who goes through a medical school practise medicine; a great many fall by the wayside. We will have the same thing in agriculture; but we are thinking now of the majority. Now in the short time we cannot give him enough practical experience. What they do in a medical school is to make the student work in the hospital before he has finished the course and we want something like that in the agricultural course.

38,761. You are confident that in the course of five or ten years your course would be made profitable for the middle-class man as against the course which is now taught in the agricultural colleges?—I would like to make this modification: the man with that training should then, if he is of average intelligence and industry and energy, be able to make a living on rented land; he may not necessarily own the land, but he can rent 20 or 30 acres or more and he should be able to make a decent living on it.

38,762. Do you mean to say that if the Government Agricultural Colleges pursue their present course they cannot make agriculture profitable even in twenty years?—No; I am not complaining of the course in the Government Agricultural Colleges. It is the educational authorities that overload the course with science. The University adds on chemistry or biology as though science were the major and not agriculture. The university chemist knows that in his Chemistry Department is laid down a course in chemistry for a man who is taking the subjects as his main course. He thinks thus: "I know how important chemistry is. The farmer must get as much chemistry as the man who is going up for the B.Sc. in Chemistry." That is the thing I complain of. It is not that our courses are better than in the Agricultural Colleges. The problem of agricultural education in India is so new that the educational authorities in general have not been quite able to realise its importance for its own sake.

38,763. The whole problem of agricultural education either in Government institutions or in private ones like yours is this, that sooner or later the boy turned out must be able to make agriculture profitable?—That is it, yes.

38,764. If you think that the present Government course is not suitable, have you any definite suggestions to make, whether to cut down that course from four years to something less or lengthen the course?—You should not cut down the course. Four years at least for the college.

38,765. You want a longer course?—The longer course is what we want, more training, not less.

38,766. More practical training in the field?—Yes, and in dealing with cattle and various other things. We must recognise that it is utterly impossible to train any one man to be a first-class general farmer and a first-class animal husbandry man and a first-class horticulturist, all in one. A man must specialise in one or the other line in agriculture.

38,767. Regarding cowdung and the supply of fuel you make a statement: "There is enough waste land along paths or roadsides where quick-growing trees could be planted so that almost every village could have an abundant supply of wood for fuel." I am not convinced if every village in India would have an abundant supply of wood for fuel by the planting of trees on waste land as you suggest. Would you explain it further?—Now how much fuel does it take to supply one family? Remember this, that because of the insufficient clothing of the villager his fuel requirements are much more than would be the case if he were properly clothed. What these villagers do in the cold nights is the whole village sits round and burns the leaves, cowdung and other organic matter they find around. They have not clothing enough and so they burn everything that could be turned into manure. But I still hold to my opinion that, in most of the villages I am acquainted with down round Allahabad, a careful policy of growing fuel woods like babul would make the village practically self-supporting in the matter of wood for fuel.

38,768. It seems to me you are concentrating your eye too much on the northern part of the country where the question of clothing chiefly comes in. Down in the south, in Madras for instance, where the climate is warm, very little of clothing is necessary, but the chief difficulty is about fuel for cooking purposes?—It is one of the problems that is always in my mind. Fuel is a thing, whether wood fuel or cowdung fuel, which will not bear the cost of transportation. So it must be produced nearby. The problem could soon be worked out. You could take a village of, say, 30 houses, with an area of 150 acres round about. There is the question of how much land would have to be laid aside to grow a sufficient amount of fuel for that village; the difficulty is in getting the work started. In three or four years the tree will be sufficiently grown for fuel; the question is what are they going to do in the meanwhile; but I think the thing can be done.

38,769. I hope you would make a trial and solve this problem of fuel in India?—We have done it for our own place.

38,770. Have you made observations regarding the position of the villager in relation to the moneylender?—When I was in Gwalior I did a lot of that and I was appalled at what I found there.

38,771. We have had no opportunity yet of examining moneylenders or their representatives or to ask them their point of view or their disabilities or any other such matter; but have you heard of any difficulties such as law's delays from the moneylender's point of view?—The moneylender is a necessity in rural economy.

38,772. *Mr. Calvert*: He is a necessity *at present*?—Yes.

38,773. *Mr. Kamat*: And the question is how to improve him?—The question refers, does it not, to the legitimate moneylender lending money at legitimate rates of interest? The moneylender's answer is that these

rascals are so insecure and they play so many tricks, and so he has to charge up to 150 per cent. per annum and there is no other way out of it. That is one of the most difficult problems that we are faced with in India. There are also other illegal exactions by the moneylender. Frequently he will not give a receipt for the money he receives. I have asked a man, "You have paid your money, what has he written?" and his reply is, "The Lord only knows; I can neither read nor write." What I found on actual investigation was that, no matter what the man paid, he was going deeper into debt and the moneylenders were receiving a certain sum and writing another and giving no receipt for what they received. There is a gentleman now in Allahabad, Mr. Hamilton, who worked out some most interesting figures; but the Maharaja of Gwalior did not allow them to be published. Mr. Hamilton had several graduates in economics from Allahabad who undertook economic surveys, especially with reference to the indebtedness of the villages, and the results were appalling. No country could possibly carry that burden.

38,774. In any case, the question why the moneylender is so rapacious and whether he can be improved, requires investigation instead of simply guessing at the facts?—Yes. The co-operative credit societies came into existence, I take it, to remedy this. Sir Frederick Nicholson and others who were interested brought them in because of the necessity of doing something. The very fact that they brought in the co-operative societies shows the necessity for some moneylending agency.

38,775. *Professor Gangulee*: Do you find that movement making an impression on the public?—Yes, I do, but unfortunately there has been some bungling and quite a little dishonesty in some places.

38,776. *Mr. Kamat*: On page 553, in the course of your general observations you say that at least 30 per cent. of the population in agriculture must be diverted to industry in India. The whole problem, therefore, of relieving the poverty of agriculturists and improving their lot is, you think, that of having more manufacturing industries into which this 30 per cent. should be diverted; is my inference correct?—I say they should be diverted to industry, commerce and transport. The point of that is that this excess of population on the land keeps wages down; human life and labour is the cheapest thing in India, and that works against the introduction of modern machinery; it does not pay to get labour-saving machinery, because you do not save anything; labour is so much cheaper.

38,777. So that, from your point of view, the question is not one of bringing more men into agriculture, but taking men from the land and diverting them into some other channels?—That is one thing; it is not the only thing. Where would you get your markets? There are so many people to-day telling us that we have got to grow more crops. A big crop is as big a curse to-day as a small crop. See what has happened in the United States with its large cotton crop, in spite of all their marvellous organisation.

38,778. *Mr. Pim*: Your experience with regard to occupancy holdings on your farm illustrates some of the difficulties that an improving farmer may meet. Of course, your difficulty arose from the security of tenure given to the occupancy tenant?—Yes.

38,779. But do you think it is essential to give that security of tenure?—The ordinary farmer must have it, yes.

38,780. You are now the zamindar; have you considered applying under the new Act?—I have already made application under the new Act; under the old Act we could not. I am glad you have brought that point out.

38,781. Do you think the new Act will meet your difficulty?—I think the new Act does meet the difficulty; but, looking at it from the general

standpoint, the new Act, in increasing the security of the ordinary tenant, is a very great gain. We are an exception in that we are an educational institution; educational institutions in these Provinces will not take up any large area of land; but it does work against the tenants that we dispossess, and I have tried to make provision for that by telling them we will give them this sewage irrigated land on a lease for a certain number of years, where I am confident they will make more on one acre than they would on 20 acres unirrigated.

38,782. You mention the sullage farm run by the Municipal Board near you. As a matter of fact, have they had any competent people in charge of that farm?—No.

38,783. Is that the explanation of its fate?—Nobody manages it properly; I have talked with the cultivators, and, in fact, one of them said openly at the auction: "If we did not have to give to the bridge peons, the *chungawallahs*, the police and the man here on the job, if we had not to give them a little of what we grow, we could afford to pay Rs.200 per acre. You are protected, Sahib; these people do not demand of you what they demand of us."

38,784. With regard to the difficulty in acquiring the village, was that question ever considered on its merits in the Municipal Board, or did the discussion go into side issues?—At first we were prevented from getting it because it was *amity*, and the village was declared to be "*waqf*"; the *waqf* papers had been drawn up but were never executed; then, after that, the relations between the two communities changed, but we did not get it just the same. In the first instance, we did not get it because the non-co-operators said: "We are not willing to vote for this American institution getting this." Afterwards, when they parted company, because one side knew that it irritated the other side, they said: "Why should we remove the source of irritation?"

38,785. You mentioned experiments made in the time of Sir Selwyn Fremantle when he was Collector, and you rather suggested that it was merely in consequence of a change of Collectors that these experiments had dropped. Has not the position completely altered since that time as regards control of these schools?—There are two factors now. The man who followed Sir Selwyn Fremantle was not interested, and nothing was done; then the District Board took them over. I am glad you called my attention to that fact; I think it ought to be known that, no matter what the Collector wished to do, it would have to be done through the District Board.

38,786. So far as you have heard or seen, are the District Boards taking a real interest in that side of education?—Well, I have just returned from leave. The most encouraging thing I have seen is that, a few days before the *Magh mela*, the District Board woke up and asked us if we would put on a farm demonstration; they said they had decided to do it, and came to us for our help. I thought that was very encouraging.

(The witness withdrew.)

Mr. EDWARD KEVENTER and Mr. WERNER KEVENTER of Edw. Keventer, Limited, Aligarh.

Replies to the Questionnaire.

QUESTION 16.—ANIMAL HUSBANDRY.—India wants cheaper and more reliable milk and *ghi* so that these important foods, particularly milk, may reach the poorer classes also.

To make milk cheaper.—Recommended: Improvement of the milk-yielding potentialities of the cow and the buffalo in India through (1) provincial control and supervision of the breeding of cattle; (2) establishment of pedigree herds of India's best breeds of cows, buffaloes and goats,

(*a*) at cattle breeding farms worked by the Government.

(*b*) by encouraging private dairy farms to breed pedigree herds by lending stud bulls and by assisting such private dairy farms to acquire suitable land for grazing and for production of green fodder crops, the Government in return reserving first claim on the male calves.

(*c*) by encouraging zamindars to keep cows and buffaloes of types approved of by the Government Cattle Breeding Department and by lending Government stud bulls to them, the Government in return reserving first claim on the male calves.

To make the supply of milk and ghi more reliable.—Recommended: Food laws to protect not only the public, but also the honest dairy man.

The rural population who can afford the cost of milk and *ghi* has no difficulty in obtaining the pure article, but for the town population protection is required in the way of food laws based on scientific knowledge. Some Municipalities in India, while paying no attention to the adulteration of milk by addition of water, enforce by-laws which go to destroy all skimmed milk, and thereby deprive the poorer classes of a cheap and most valuable food, and besides deprive the producer of its legitimate price.

A standard of milk ought to be adopted and enforced.

Ghi is being adulterated, as a rule, by the middleman by the addition of animal fats, extracts of vegetable oils and *senji*. Enforcements of suitable food laws only can stop this.

(*a*) (ii) *The betterment of the dairying industry.*—Recommended:

(1) Food laws as suggested above.

(2) Teaching modern methods of handling milk, manufacturing of butter, casein, milk sugar and cheese at the agricultural colleges, bearing in mind always that for the teaching of methods to students there is no justification for a large production, such as aimed at by the butter factory of the Imperial Agricultural Department at Anand which will, if allowed to extend its trade activities in the butter market in India, more or less destroy the prospects for private dairy enterprises, since the demand for butter within India is a very limited one, the large majority of people being accustomed to the use of *ghi*, for the manufacture of which no modern and costly dairy factory is required. A butter factory owned by the Government is backed by unlimited capital and credit, without any personal pecuniary risk of loss to the individual organizer, and carries with it an unearned reputation and guarantee which no private enterprise possesses except through long, honest and efficient service to the public. A comparison will disclose to every fair-minded person the great injustice trade competition from Government concerns does to private enterprises. Proof of the paying possibilities for dairy farming in India is already in evidence in the country.

(3) Milch cows and milch buffaloes to be carried by fast trains on the railways at concession rates, not exceeding the rates charged when booked

by goods train. The suffering caused, particularly during the hot weather, to milch cows, milch buffaloes and their small calves in being confined to an iron covered railway truck for five days and five nights in succession, as is the length of time for such a journey by goods train from Delhi to Howrah, during which time the animals cannot lie down more than two at a time, nor be properly milked or fed, results often in permanent injury, and through the rough shunting at junction stations, which goods trains are subject to, sometimes total loss of animals. Eight cows or buffaloes with their sucking calves (the number of animals carried in one truck on broad gauge lines), are carried from Delhi to Howrah (903 miles) at a freight charge of Rs.282 when booked by goods train, while, if booked by passenger or parcel express train, the freight charge is Rs.620-13, which is prohibitive.

It seems hard to a purchaser of the best milch cows and buffaloes obtainable not to be able to bring them to their destination in the same condition as they were when purchased, but almost as a rule deteriorated to half the value paid for them. The scarcity of good milch cows and buffaloes is growing worse from year to year. One of the reasons for this is that the best milch animals in the cattle producing Provinces are brought to Calcutta and to Bombay, where at the end of lactation thay are sold for slaughter, because the milk-vendors in these towns cannot afford to stall-feed dry cows until they calve again, nor can they afford to send them back to their former home because of the high railway freight. A reduction in the railway freight charges would to a great extent eliminate this deplorable waste of valuable cows and buffaloes.

(4) The removal of import custom duty on

(*a*) Seamless milk and cream cans.

(*b*) Glass milk bottles with closing devices, such as discs, caps and seals.

(*c*) Milking machines and their component parts.

(*d*) Milk testing appliances and instruments.

(5) Reduction in railway freight charges on butter, *ghi* and cheese when booked by passenger or parcel express trains. Owing to the great heat in India, butter carried by rail has to be packed in insulated boxes with ice from early March to the end of November. As an instance, a box containing 50 one-lb. tins of butter with insulation and ice packing weighs gross 1½ maunds, and the railway freight on this parcel from Aligarh to Bombay is Rs.8-12, or annas 2.8 per lb. of butter, and from Aligarh to Howrah Rs. 8-4, or annas 2.64 per lb. of butter, which in addition to the cost of the necessary insulation material and ice adds considerably to the manufacturing cost. If refrigerating railway vans existed for carrying of dairy produce, the costly method of ice packing would be eliminated, but the introduction of such vans on all railways for the sake of the dairy industry may not be practicable for a long time to come, and therefore a reduction in the railway freight charges would meet the need best. Should export of Indian butter become desirable, refrigerating vans on certain railways as well as cold storage houses at the ports of Bombay and Calcutta, also cold rooms on board such ships which undertake to carry the butter should be provided.

(*b*) (i) *Overstocking of common pastures* cannot be said to exist anywhere in India, because there is no pasture for the cattle worth the name of pasture except during the rains when the common land produces more than ample pasture for the herds in existence. By November the common land of the villages is practically useless as pasture, whether it has been grazed or not during the monsoon months. Production of green fodder crops is essential for rational feeding of improved Indian herds of cattle.

QUESTION 18.—AGRICULTURAL LABOUR.—The shortage of agricultural labour at harvest time in the months of October and November is much felt, but

the shortage is due to malaria epidemics which, as a rule, are prevailing at those times. If travelling dispensaries were established in large numbers which could reach the rural population with free and frequent distribution of quinine and other simple medicines, a great improvement in this respect would result.

Oral Evidence.

38,787. *The Chairman*: Mr. Edward Keventer, you represent the firm of Edw. Keventer, Ltd.?—(*Mr. Edward Keventer*): Yes. I have with me Mr. Werner Keventer, who is managing the business.

38,788. Will you tell us quite shortly what your business is, and something of its scope?—The Aligarh dairy farm is our head farm, and we have four branch farms, at Darjeeling, Calcutta, Delhi and Simla.

38,789. Are you tinning butter?—To a certain extent.

38,790. Is that the principal part of your business?—No; our principal trade is in fresh butter.

38,791. On the question of improving the milk yield of Indian cattle, I gather your view is that, on the whole, matters are moving in the right direction, but you would like to see them go a little faster? Would you like to have provincial experimental breeding stations? You refer to provincial control and supervision of cattle breeding?—(*Mr. Werner Keventer*): We think control should be left to the Provincial Governments, but private enterprise should be encouraged to work on the same lines.

38,792. Does that mean you do not think the Government of India, as such, should take part in the work?—No, we think they should.

38,793. Both the Government of India and the Provincial Governments?—Yes.

38,794. Where does the milk you handle come from? From your own cows?—We have our own herds and also buy from *gowalas*.

38,795. Are you familiar with the Military dairies?—Yes.

38,796. Do you know their farm at Lucknow?—Yes.

38,797. Have you seen there the results of crossing Friesian blood with indigenous animals?—I know the result of crossing with Ayrshires.

38,798. The feature of the farm at Lucknow is the cross I mention, and I think there are strong indications that it is a very good blend?—We believe so, too.

38,799. In the matter of teaching dairy farming, you do not think manufacture on a large scale is necessary for purposes of instruction, and, in your opinion, what the Imperial Agricultural Department is doing at Anand amounts to unwarrantable competition with private enterprise?—Yes.

38,800. Without expressing a view on that point, I should like to ask whether you think on the technical side a good deal of experimental work still remains to be done? I am thinking of the possibility of making milk powder, condensed milk and things of that sort in India. Is that a line on which you would like to see Government carry out purely experimental work?—Condensed milk can no doubt be made in this country, but we doubt whether it would be a financial success.

38,801. What about the preparation of casein?—That can be made successfully, and is being made in India now to a considerable extent.

38,802. You will probably agree that in the present state of the demand for dairy produce of good quality it is very necessary, if the industry is to prosper, to develop all these side-lines as much as possible?—Yes.

38,803. Is there any reason why a large part of the tinned butter at present imported into India should not be made and tinned in India?—As far as we know, only a small amount of tinned butter is imported into India.

38,804. But a great deal of condensed milk comes in?—Yes.

38,805. You put forward certain views about the facilities offered by railway companies and the freight rates charged for cattle. If you are sending a pedigree animal, I suppose it is possible to send it in a horse-box?—Yes.

38,806. But that means extra expense?—Yes.

38,807. Having regard to climatic conditions and to the great distances Indian railways have to contend with, do you think the existing service is really as bad as you paint it here?—Yes, that is our experience.

38,808. You say: "The suffering caused, particularly during the hot weather, to milch cows, milch buffaloes and their small calves in being confined to an iron-covered railway truck for five days and five nights in succession . . . " is considerable. There are two points there. First of all, is it your suggestion that the railway trucks should be improved?—Yes, given a different roof and flooring.

38,809. You cannot do very much about the five days and five nights, can you? That follows the geographical situation?—In former years we were allowed to have our cattle trucks attached to passenger trains and also to the parcels express, which go faster.

38,810. There has been a worsening of the position of late?—It is still allowed if we pay special rates, but these are prohibitive.

38,811. Originally, you enjoyed this advantage for the same rate as was charged for goods trains?—Yes, as a special favour the railway allowed us that privilege.

38,812. Have you any views as to the possibility of improving the fodder supply during the season of shortage? How do you manage that in the case of your own herds? Do you grow fodder crops?—We grow our own fodder crops.

38,813. What do you grow?—During the winter, oats; during the summer, chiefly *juar*.

38,814. Do you grow any clover or berseem at all?—We have grown berseem, but not successfully. This year we are trying clover in two places, Aligarh and Delhi, but only as an experiment. We are very successful with oats and we also grow mangel-wurzels.

38,815. Do they do well?—Yes.

38,816. Do you find they keep in India?—No. We feed them as soon as they are ready; we cannot store them.

38,817. Do you attempt to preserve any fodder by means of silo pits?—No, because we have not that quantity of fodder. What fodder we have we can feed while it is green.

38,818. It would not pay you to make it into silage?—It would if the stuff were available.

38,819. Do you make *ghi*?—Yes.

38,820. Do you use a modernised process for that or the indigenous system?—We do what everybody who makes *ghi* in India does: melt down the butter, remove the moisture by boiling, and tin it.

38,821. I wondered whether you had devised any large-scale process?—No, because the market price for *ghi* is such that we cannot make it at a profit. We make *ghi* at a loss when we have a surplus of butter; that is all.

38,822. What fuel do you use?—Coal, or kerosene oil in Primus stoves.

38,823. We have been told that cowdung is an ideal fuel for the manufacture of *ghi*, as it gives a smokeless fire without any flame?—I do not think it matters what you use.

38,824. You can make just as good *ghi* with any fuel?—I am sure of it.

38,825. Are you carrying out any breeding experiments?—Yes.

38,826. Are you trying crossing with European breeds?—Yes, we have tried crossing with Ayrshires and been quite successful. We have just brought out an Ayrshire bull from Scotland, which is on its way up to Simla. We have also brought out black Welsh cattle, and are experimenting with this breed in Darjeeling.

38,827. Would you like to see the public in the large towns in India protected against adulterated or impure milk and milk products, either by new municipal laws or rules or a stricter enforcement of existing ones?—We welcome control, but it should be of a kind that does not destroy any of the products.

38,828. Meantime, as regards an important part of the market, the honest dealer can hardly hope to compete with the dishonest?—That is true.

38,829. What do you mean when you say "that does not destroy any of the products"?—We speak from experience of two Municipalities in India where bye-laws have been introduced to the effect that skim-milk must be coloured in order to prevent admixture with whole milk. This is carried out although there is nothing to prevent the watering of milk.

38,830. So that you destroy the skim-milk trade without protecting the public against adulterated milk; is that the point?—Yes.

38,831. What colouring is used?—In one place the colouring matter from Jesu flower was first used, giving a yellow-pink colour. This did not serve the purpose, and it was then suggested catechu should be added. That is very astringent. That is still in force in one Municipality.

38,832. Which?—Muttra.

38,833. That is also yellow?—Yes.

38,834. Does not that make the skim-milk look like Jersey full milk?—It looks discoloured, and it spoils the flavour altogether; no human being could drink the milk.

38,835. Is that the intention of the rule?—I cannot say.

38,836. Has your firm, or any other interest, got large creameries there where butter is manufactured and the skim-milk sold?—At the time this was introduced we had a creamery there, the cream of which was sent to Aligarh for butter making.

38,837. I suppose this rule would make it impossible for you to sell the by-product, skim, from the manufacture of butter, while still leaving the local dairymen free to sell adulterated milk?—Yes.

38,838. Whence did the stimulus come for the passing of this rule?—Possibly from a certain class of the public.

38,839. *Sir Thomas Middleton*: When did you first come to India, Mr. Edward Keventer?—(*Mr. Edward Keventer*): At the end of 1889.

38,840. Did you join the Bombay Agricultural Department?—I was first sent out by the Dairy Supply Company, of London, to introduce modern dairy appliances. After that I went to the United Provinces for a short time to carry out some cheese-making experiments, and in April, 1890, I was taken on by the Bombay Agricultural Department.

38,841. You worked at Poona?—Yes.

38,842. With Mr. Ozanne, Director of Agriculture?—Yes.

38,843. How long were you there?—A year.

38,844. When did you sever your connection with Government?—Up till November, 1894, I was running the Aligarh farm for Government. I was then offered the farm on lease by Mr. (later Sir John) Miller, who was then Director of Agriculture.

38,845. How many cows have you of your own at the present time?—About 700 head of cattle all told.

38,846. What yield per lactation do you aim at?—The average yield is very low.

38,847. What do your best cows yield?—I cannot say the lactation, but the maximum yield is 18 seers a day.

38,848. From country cows?—Yes.

38,849. You must buy cows in large numbers, and no doubt you select them very carefully. What percentage of those you buy satisfy you when you get them on your farms?—A number of them prove failures owing to the bad treatment they receive in transit, being carried in unsuitable trucks in the hot weather. About 50 per cent. satisfy me.

38,850. How much grain or concentrated food do you allow your best milkers between the months of January and June, in the dry season?—About 16 lbs.

38,851. Do you feed much hay to the cows on your farms?—Yes, at Aligarh and Delhi we give them what hay we have.

38,852. Which do you rely on most, hay, or *kadbi* from *juar* and *bajri*?—We use *kadbi* to a certain extent.

38,853. Which do you prefer, hay or *kadbi*, weight for weight?—We have not access to good hay, and prefer the *kadbi* to the hay we are able to buy. We feed the *juar* green, so that it is not dry *kadbi*; but even the dry I prefer to the hay I am getting.

38,854. You say there is no over-stocking of common pastures in India because there is ample pasture during the rains, and nothing after November. I think you must be referring to a very small part of India when you say that. Even in the rains one often sees that common pastures are bare and that animals come off them in very poor condition. Has that not been your experience?—(*Mr. Werner Keventer*): Not in our part of India.

38,855. Not in the United Provinces?—Our experience is that there is ample grazing during the rains when there is a good monsoon, but no sooner is the monsoon over than it ends.

38,856. That experience must be quite local; there are many districts to which it does not apply?—We are speaking of Delhi and Aligarh.

38,857. *Sir James MacKenna*: How many cattle have you under your control?—(*Mr. Edward Keventer*): About 700.

38,858. How many indigenous cattle?—They are all Indian cattle, except for a few crossbreds at Darjeeling.

38,859. Is mortality high amongst your cattle? Do you lose many from rinderpest?—Owing to the system of inoculation we do not now.

38,860. Do you use the simultaneous method?—No, the serum alone. As soon as we see a case we get them all inoculated.

38,861. That has proved effective?—Yes, it has been a great blessing.

38,862. What is the principal breed you are dealing with?—Sahiwals from the Montgomery district and the Hissar breed.

38,863. Do you do any grading-up by selection with these breeds?—We keep the best and dispose of the inferior ones. We never dispose of a young pedigree cow.

39,864. Do you think the herd is being graded up? Has there been any improvement in the milk-yield?—To a certain extent. We have not good pasture all the year round; we would have had more of our young cattle left if we had a better farm.

38,865. What do you charge for milk delivered in bottles in Delhi?—(*Mr. Werner Keventer*): I think it is 9 annas a quart (40 ounces), but we have so many places it is difficult to remember what the local rate is. As a special rate, we supply hospitals at 4 seers to the rupee, but in cans, not bottles.

38,866. You still have a shop in Rangoon?—Yes, but not for milk.

38,867. *Professor Gangulee*: Is it pasteurised milk that you sell in Delhi? —Yes.

38,868. *Sir James MacKenna*: How does that compare with the price of milk in London?—I cannot say.

38,869. Do you consider the Delhi price a fair one?—Yes.

38,870. Do you have to meet any competition in any of your products in India?—Yes, in Simla from the Government Military dairy.

38,871. They compete in the open market?—Yes. In July 1925 the Military Dairy Department, without any warning to us, organised a kind of trade campaign with the object of capturing all our trade in Simla. The Punjab Trades Association took the matter up with the Director of Farms, with the result that in October of the same year the Military farm restricted their trade activities in Simla to Government servants, inclusive of the United Services Club, which had been our best customer since the time we started in Simla. This restriction, however, has not been of much benefit to us, since at least 75 per cent. of our customers in Simla have always been Government servants, and our dairy farm there was originally started to meet a general want for a reliable supply of milk for Government servants and their families. At that time there was no Military dairy farm at Simla.

38,872. Did they undersell you?—Yes, they offered milk at 3 annas a pound.

38,873. You sell by the quart?—Yes, at, I think, about 10 annas a quart (40 ounces).

38,874. Do you do any training of Indians in dairy work, Mr. Edward Keventer?—(*Mr. Edward Keventer*): No, only for our own staff. I did when I was working for Government, both in Bombay and Aligarh.

38,875. You think the great obstacle to the development of a commercial dairying industry in India is the inferority of the cattle; that is the reason more people do not take it up. Have you any suggestions to make for the improvement of the cattle of the country in general?—I think crossing with Ayrshires has proved a success, although I know it is doubted by the Military farms, which have more experience of it than I have.

38,876. There is also the question of susceptibility to disease?—Yes. There are several drawbacks.

38,877. Would you put the development of cattle-breeding before the development of the dairy industry, that is from the point of view of the recommendations that one might make about the expansion of agriculture? —There is now a great competition in this matter by private parties.

38,878. But I suppose that will not advance very far until and unless the cattle are improved?—Yes; the cattle are deteriorating. So far as I remember when I started the business about thirty years ago it was very much easier then to obtain good cattle than it is now.

38,879. Were they better milkers?—Yes. It was easier to obtain good milch cows then; they are becoming more and more scarce now.

38,880. For the development of the dairy industry the first thing is to improve the cattle obviously?—Yes.

38,881. *Professor Gangulée*: What indigenous breeds have you?—Sahiwals and Hissars.

38,882. Pure bred?—We get Sahiwals and Hissars, and we also try to get others which have those characteristics.

38,883. Do you have a system of milk recording?—Yes: at our farms we record the amount of milk in the morning and in the evening.

38,884. You test for butter fat and so on?—Yes; for our own milk we test occasionally.

38,885. Do you buy milk from outside too?—Yes, for butter-making.

38,886. From the neighbouring villages?—Yes.

38,887. On what conditions?—We pay them according to the percentage of butter fat.

38,888. And these people are all *gowalas*?—They are cultivators mainly; we do not buy from the professional *gowalas*, but only from the cultivators or ryots in the villages.

38,889. Do you also deal in buffaloes' milk?—Yes.

38,890. Do you find the people prejudiced against the use of buffalo milk? —We do not buy bufalo milk with a view to selling it, but for creaming the milk and using the cream for butter-making.

38,891. You also make cheese, do you not?—Yes.

38,892. Have you worked out the cost of production per gallon of milk?—Yes.

38,893. Could you give us an indication of what the cost is?—It barely pays us. The milk that we sell barely pays us at the prices that I have just mentioned, namely, 8 as., 10 as., and 12 as.

38,894. I do not want you to include the cost of distribution? I wanted to know just the cost of production on the farm itself, the feeding cost, the overhead charges, and so on?—We have mixed up all the expenses.

38,895. Do you have sufficient pasture land for your herds?—No.

38,896. And therefore you depend chiefly on stall-feeding?—Yes.

38,897. And you have enough fodder supply throughout the year?—We purchase a lot of fodder. We used to purchase *bhusa*, but now we cut grass; in Calcutta however we purchase straw fodder.

38,898 Do you find that there is an increasing demand for pure dairy products in this country?—Yes.

38,899. Amongst the Indians?—Yes, there is an increasing demand.

38,900. For pure *ghi*, pure butter, pure cheese?—Yes.

38,901. What percentage of your customers in Calcutta are Indians?—A very small percentage so far.

38,902. You suggest that a standard of milk ought to be adopted here and enforced. How would you enforce the standard? Would you do it through legislation?—It is enforced in Calcutta and I want it to be enforced in the same way here.

38,903. Is it enforced in the municipal areas of Calcutta?—Yes, also in Bombay and Darjeeling I think.

38,904. Are your calves weaned?—No, we feed them in the Indian way.

38,905. What do you mean when you say that you feed them in the Indian way?—They are allowed to suck their mothers partly.

38,906. Do you employ trained men in your industry?—We train the men ourselves when they first come to us.

38,907. Have you any dairy classes?—No, we have them working with us in the dairy and in that way they pick up the business.

38,908. Do you find that there is an increasing demand for dairy implements in this country? You said just now that many educated Indians are taking to the dairy business?—There is a good demand for cream separators, Alfa Lavol, of which we are the agents.

38,909. You suggest here that the removal of the customs duty would help the industry?—Yes.

38,910. Do you use milking machines yourselves?—Yes.

38,911. *Mr. Calvert*: You said, I think, that the standard of animals was steadily improving in your own herd?—We have nothing to boast of in that respect, because as I said we have experienced a great deal of difficulty with regard to grazing land and I have not been able to do as much as I might have done had conditions been more favourable.

38,912. You do not breed your own animals, do you?—Yes, we do.

38,913. But you still have to buy, have you not?—Yes, we also buy.

38,914. Do you also keep a piggery?—Yes, at Aligarh.

38,915. That is for using the butter-milk?—Yes, for using the residue from the dairy.

38,916. A complaint was made yesterday that your pure milk was too dear for the ordinary townsman. Do you find that the ordinary townsman is not prepared to pay a fair price for pure milk?—They are rather inclined to purchase inferior milk at cheaper rates. They do not pay sufficient consideration to the quality of milk.

38,917. You mentioned that there is a scarcity of good milch cows and that you have to pay more for them. Do you think that is due to the fact that there are fewer good milch cows in the country, or that fewer good milch cows come into the market for sale?—I think myself that the market has been tapped too much. The best cows obtainable are bought by milk vendors in Bombay and Calcutta who do not look after the cows properly, with the result that, when they get dry, they find it very costly to stall-feed the cows, and so they sell them to the butcher.

38,918. Do you think that the total number of good milch cattle is declining?—I think so.

38,919. You do not think that this shortage is due to the fact that the people now are getting more prosperous and are not so willing to sell their best cows?—The irrigation scheme up in the Punjab has turned such a lot of land into culturable fields that they have actually reduced the number of cattle.

38,920. Has not the land in Montgomery been given out on the condition that the grantee maintains a number of Sahiwal cows?—I have no knowledge of that.

38,921. *Sir Thomas Middleton*: With reference to the slaughter of good cows in the large cities, can you give us any idea to what extent this practice goes on? Of the cows that go into Bombay would you say 75 per cent. are slaughtered?—I am sorry I cannot say; but I think that practice is followed to a great extent. I feel that the number slaughtered would be 75 per cent.

38,922. *Sir Henry Lawrence*: Have you tried any Jersey bulls?—No.

38,923. Have you seen any results of experiments with Jersey bulls? —No.

38,924. Do you think the Government of India in their Military farms have tried a sufficient number of experiments with different varieties of breeds?—They have tried, I think. Some Jersey bulls were imported, I believe, to Ambala. They were imported for crossing, but they all died, I believe.

38,925. When was that?—About five years ago.

38,926. That is the only experiment you know with that breed?—Yes.

38,927. *The Chairman*: Do you deal much in buffalo milk?—Yes, principally for buttermaking and cheesemaking.

38,928. Is the figure of 700 to 800 animals that you have given us composed partly of cows and partly of buffaloes?—They contain quite a small proportion of buffaloes.

38,929. That is a small part of your business, I take it?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Tuesday, the* 15*th February,* 1927, *at Agra.*

Tuesday, February 15th, 1927.

AGRA.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S. } (*Joint Secretaries*).
Mr. F. W. H. SMITH }

RAJA KUSHAL PAL SINGH, M.L.C., United Provinces.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i).—No.

(ii) There is urgent need for extension of facilities for teaching agriculture in many districts.

There is only one agricultural school in these Provinces, viz., at Bulandshahar. The Government has not yet established any other school after the agricultural school at Bulandshahar was opened; but the Government intends to open a second agricultural school in the eastern part of the Province. The reason why Government has not opened any other school is that Government was anxious to ascertain by experience the demand for such school before opening new ones.

The arrangements so far made by Government for meeting the demand for agricultural education do not touch even the fringe of the demand. Only ten teachers were deputed from ten vernacular middle schools to undergo a course of training at the agricultural school at Bulandshahr. The inadequacy of the arrangements by Government will appear from the fact that the Agra District Board alone wants to train five teachers in agriculture for opening five agricultural classes. The Principal of the Bulandshahr Agricultural School informs the Board that he cannot manage to teach more than one teacher a year. In the year 1924, the number of vernacular middle schools in the United Provinces was 573. The demand for more vernacular middle schools continues. Presumably the number has considerably increased.

"The Punjab has recently struck out a line of its own, which seems to possess great possibilities. Ordinary vernacular middle schools are now being utilised for imparting practical training in agriculture to school boys in rural areas. There are two special features of the scheme which have so far contributed much to its success. In the first place, there is attached to each school a farm whose area and equipment is sufficient for practical training on a reasonably large scale. This farm can be made practically self-supporting. In the next place, the training is given, not by one of the ordinary school teachers, but by a teacher specially selected for the work, and trained for a year in the Agricultural College at Lyallpur.

The new scheme has achieved an immediate popularity, and has already spread to a quarter of the total number of vernacular middle schools in the Province." (*India* in 1923-24, p. 241.)

". . . . It is on her agricultural colleges and agricultural middle schools that India must rely if she is to produce the type of highly educated farmer whose influence is so important in raising the level of tillage methods throughout any country." (*India* in 1924-25, page 186.)

So far as agricultural education in primary schools is concerned, absolutely nothing has been done or attempted by the Government.

Paragraph 4 of the Resolution on Dr. Kitchlew's report runs as follows:—

"The Government desire to see the actual teaching in the village school adapted to the needs of the village life, and not based on the requirements of the city child. Two special points are worth attention. The adjustment of holidays to agricultural requirements, and the development of cultivated plots attached to the school. There should not be any difficulty about holidays, now that Government have modified the method of examination at the end of the primary stage. The hours of school session may be a more difficult matter, but this question should be examined by the Director of Public Instruction. As regards the second point, the Government realise that school cultivation which is a failure may be worse than none at all, and that the town trained teacher is not likely to have much natural enthusiasm for it. But they think that at this point the Education Department should join their efforts with those of the Agricultural Department. There seems no reason why school agriculture should not be successfully developed at a select number of prospering schools, and why the Department of Agriculture should not help with its seeds and methods, so as to make the school a lesson to parents. This question should be examined by the Director in consultation with the Agricultural Department and definite proposals should be submitted to Government."

The development of cultivated plots attached to schools is a big question and requires a very large sum of money. The examination of the scheme and the formation of concrete proposals will take a long time. In the meantime I desire that I may be permitted to work my scheme. My scheme is as follows:—

Selected teachers from vernacular schools should be sent to the Bichpuri farm for training in improved and up-to-date agricultural methods. These teachers after they have received the necessary training should be made to give practical instructions to their pupils.

In the current year I want to give practical education in agriculture to 25 teachers. From July next I want to increase this number to 70. These teachers will work on the Bichpuri farm at stated times, off and on for about three months a year and acquire practical knowledge of agricultural practices as well as of improved varieties of crops and improved implements. Instruction will at every point be closely allied with the doing of the thing. A course for them will be drawn up by the Superintendent of Agriculture on the Bichpuri farm. On completion of these short courses these teachers will be posted to villages where improved varieties of crops have been introduced or where improved implements are in use. These teachers, who have acquired practical knowledge of manures or combinations of manures, will show to their pupils the best manures that are used by skilful cultivators. A liking for agriculture will be created and more knowledge will mean larger outturn. In several villages some cultivators have taken to the growing of those varieties which pay best and teachers and schools will be the best medium of diffusion of knowledge of the best varieties and improved implements. Improved seed is available in the district for distribution. Teachers can show the advantages of using improved seeds and spread their use.

The present staff at the Bichpuri farm is sufficient only for its own purposes. I want that for one year three extra Inspectors of Agriculture

should be attached to the farm so that they may give practical training to 70 teachers. Their services will be required for three months in a year. When these teachers have finished their courses they will teach practical agriculture by taking their pupils to fields run on approved lines and impress on them the advantages of introducing improved varieties of crops or improved implements. These teachers will visit the Bichpuri farm each year to keep their practical knowledge up to date. The demand for agricultural education has been insistent. In August last I wanted to select 40 teachers for training in agriculture. Nearly 300 teachers offered themselves as candidates. On completion of short courses these teachers will be given a monthly allowance of Rs.2 each.

Fortunately for the Agra district the inspecting staff are most enthusiastic workers, and they are determined to make the scheme a success.

(iii) Yes.

(iv) The question of stimulating the demand does not arise in these Provinces as the demand is far in excess of the supply.

(v) Service.

(vi) Not necessarily.

(vii) Greater stress should be laid on practical work than on theoretical teaching. The period of training for normal trained teachers should be increased from nine to twelve months.

(viii) A large majority of our teachers pass the Vernacular Teachers' Certificate Examination. They are taught nature study and object lessons. They do not understand these subjects properly. The result is that in the district of Agra, these subjects are not taught in any single school. School plots have not proved successful in the Central Provinces. I do not think they will prove successful in our Provinces. It is very difficult to protect these plots from cattle which browse plants grown on them. They are too small to allow improved agricultural practices to be demonstrated therein. School farms are of great utility, but they can be attached only to middle schools and schools in suitable localities on account of the initial outlay involved and the cost of maintenance.

(ix) Mostly Government service.

(xi) No.

(xii) By means of successful demonstration.

(xiii) The scheme has been outlined above. The Government should make a grant to the Agra District Board which would work out the scheme.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The measures which have been successful in influencing and improving the practice of cultivators are (i) the cultivation of small plots on their own lands by cultivators with own hands under the supervision of the Agricultural Department, (ii) seed and demonstration farms, (iii) implements depôts, and (iv) the starting of exhibitions and competitions at different places to show what results improved methods and improved implements can bring about.

(*b*) Cultivation of small lots on cultivators' own land by the cultivators themselves.

(*c*) Frequent demonstrations of improved methods, distribution of small pamphlets in simple language pointing out what advantages are likely to accrue from the adoption of expert advice.

(*d*) The Bichpuri farm bears eloquent testimony to the success of improved methods. The profits made by this farm in 1925-26 were Rs.2,681 and in the current year Rs.3,000. It has largely helped to popularise improved agricultural methods and improved implements.

QUESTION 4.—ADMINSTRATION.—(*c*) (i) The number of Inspectors of Agriculture is too small. There are only three Inspectors in the district of Agra. Their number should forthwith be raised to five as they cannot at present cope with their work.

QUESTION 5.—FINANCE.—(*b*) The Agra Tenancy Act and the rules made under the Land Revenue Act have given great stimulus to zamindars to cultivate their *sir* lands. The reduction of revenue on *sir* land from 25 to 15 per cent. is an additional incentive. The Government should give them *taccavi* for agricultural improvements on easy terms.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) Indebtedness is often a legacy left by the forefathers of the cultivator. There is practically little surplus left after the expenses of the maintenance of his family are deducted from the gross produce. The other reasons are unthriftiness of the cultivator, extravagance on the occasions of births, marriages and deaths, and seasonal calamities.

(ii) The sources of credit are the village moneylender, co-operative credit where the societies exist, and *taccavi* advances made by zamindars and Government.

(iii) The reasons preventing repayment are the same as stated in (i).

QUESTION 23.—GENERAL EDUCATION.—(*a*) So far as higher education is concerned, agriculture has not been made a subject by any of the Universities in these Provinces. Should it be made a subject, many students, especially sons and near relations of the large landholders will prefer to take agriculture; the poorer classes of the population too do not seem to favour a rigid vocational education but prefer that their sons should receive training less restricted in its scope. Practical agricultural education under the supervision of Universities should be encouraged by making agriculture a subject for the B.A. and M.A. examinations. There are only three high schools in the United Provinces (Jamna Mission High School, Allahabad; the District Board High School, Kanauj; and Isabella Kohum College, Lucknow) which teach agriculture. Government should open agricultural classes in those of its high schools where there is likely to be an effective demand for agricultural education. The subject of agricultural education in elementary schools has already been dealt with. (*See answer to Question 2.*)

Oral Evidence.

38,930. *The Chairman*: Raja Kushal Pal Singh, you have provided the Commission with a note of the evidence that you wish to put before us; would you like to say anything in amplification of that note or shall we ask you questions?—I have nothing to add.

38,931. I see you are a member of the Legislative Council?—Yes; I am also Chairman of the Agra District Board.

38,932. Are you a landholder?—Yes.

38,933. Do you farm your own land at all?—No; I used to do so some years back, but for the last five or six years I have been living at Agra.

38,934. Do you keep in touch with practical farming?—Yes.

38,935. Have you large estates?—I pay a land revenue of Rs.90,000 a year.

38,936. Is that land irrigated or not?—It is partly irrigated by canals, but on the bulk of the property there are no canals; there is irrigation from wells.

38,937. Tube-wells?—No, not tube-wells, ordinary wells, most *katcha* wells.

38,938. How is water lifted from most of these *katcha* wells?—By the ordinary process, with a leather bucket.

38,939. By hand or by bullock lift?—By bullock lift.

38,940. By Persian wheel?—No, the Persian wheel is for a low lift of from 4 to 8 feet.

38,941. The Egyptians are rather more enterprising than that?—They have introduced an improved variety of Persian wheel here at Bichpuri; they have made certain improvements in Persian wheels.

38,942. In your note you have given an answer to our Question 2 on agricultural education?—I have divided the subject into two parts: middle vernacular schools and primary schools.

38,943. I think your suggestion is that the Bulandshahr type of school is the one that you wish to see extended?—Yes.

38,944. Have you been to Bulandshahr at all?—I have not.

38,945. Do you know the curriculum there?—Yes; greater stress should be laid on practical work; that kind of practical work can be taught at Bichpuri farm by Inspectors of Agriculture.

38,946. At what age do you suggest the boys should go to these schools which you wish to see set up?—Boys do not go. Teachers alone are sent.

38,947. Do you think that the public would be prepared to pay for this extension in the educational system which you propose?—In what way?

38,948. Taxes. Is there any other way in which it could be paid for? Such schools can be supported by the District Boards; the District Boards can contribute something.

38,949. By further taxation?—Yes.

38,950. Do you think that the public would be prepared to support a proposal for further taxation?—The demands are becoming very great, and the District Boards will have to impose new taxation very soon. As regards the middle vernacular schools, I want teachers to be permitted to attend farms in the district; in some of the districts there are farms, as for instance, in the district of Agra. The Agricultural Inspector could teach them very well here. Greater stress should be laid on practical work; the curriculum of Bulandshahr School might be altered so as to pay more attention to practical work.

38,951. Is it your suggestion that a vocational bias should be communicated to the curriculum of primary schools?—Not exactly vocational; what I mean is that teachers should periodically visit farms; they should remain at those farms off and on for about three months every year, and they should work with their own hands under the supervision of the Inspectors of Agriculture; they should go to those farms at the time of such seasonal operations as sowing and harvesting.

38,952. This is in the primary school?—This is for teachers; when those teachers return to their schools they should take their pupils to the fields and there instruct them as to the use of improved methods and implements.

38,953. Do you not think the primary schools are better occupied in trying to teach literacy to the children?—Yes.

38,954. Do you not think that is the true objective of primary education?—That is, no doubt, so, but that has become the sole objective; in addition to that we must prepare the pupils for their life work, which is the industry of agriculture. The present system of education does not equip the boys for their life work. To prepare them for their life work should be the primary object; the secondary object should be to make them literate.

38,955. You think there is time to teach them both?—Yes, there is; the two things can be done easily, as they are connected with each other.

38,956. Have you considered the cost of putting every teacher in your primary-school system through a course such as you suggest?—It will not

be necessary to give practical training to every teacher, because this practical training in agriculture will only be given by the head teacher in the third and fourth classes. Generally, in a district where there are about 300 or 350 primary schools, the total number of teachers is about 700; so that for the present we shall have to teach about 300 teachers. We can find money for that purpose; we shall have to give them very little in the beginning and during training.

38,957. What do you wish to say for or against the teaching of English in middle schools?—Some very brilliant students join English schools and the teaching of English is very helpful to them, but not to others.

38,958. Would you like to see middle schools without any teaching in English at all?—No, because that would be a serious handicap to brilliant boys.

38,959. *Professor Gangulee*: You refer on page 600 to the Agra Tenancy Act; what provisions in that Act do you think have given stimulus to zamindars?—Under Sections 40 and 41, zamindars can acquire land for improved agriculture from occupancy tenants, and they can acquire land from statutory tenants for their own cultivation for establishing orchards or gardens; there is provision for the forcible acquisition of land for the purposes of agriculture, horticulture and gardening.

38,960. Do you think the zamindars in this Province have taken advantage of that provision?—They will; it is too soon to say to what extent they will profit by those provisions. Generally they are taking advantage of it; the new Act came into force on the 7th September, 1926.

38,961. *Mr. Calvert*: Is sugarcane largely grown on your estate?—In the district of Agra it is largely grown.

38,962. How much do you think your selected teachers could learn about sugarcane in three months?—They can learn a lot.

38,963. Have you ever seen a book by Mr. Noel Deerr on sugarcane?—No, I have not.

38,964. You speak of the demand for agricultural education; do you mean demand at a price? What price are they prepared to pay for agricultural education?—By "demand" I mean that teachers are very anxious to learn agriculture; there are about 700 teachers under the Agra District Board, and about 300 or 400 of them are very anxious to learn practical agriculture.

38,965. But at what price? How much are they prepared to pay for it?—Not exactly pay for it, but they will go to Bichpuri farm, they will spend their own money, they will feed themselves at their own expense.

38,966. The demand is practically for free agricultural education?—Free agricultural education, of course; primary education here in the district of Agra is already free.

38,967. You speak of indebtedness being often a legacy left by the forefathers?—Yes, that is so.

38,968. Would you encourage insolvency among cultivators?—No.

38,969. Would you let this inherited debt go on?—I have not thought over the subject, but I think there would be serious difficulties in the way, because if they once become insolvent they will not be able to get money from anywhere, and they will be worse off in that case.

38,970. Do you not think that insolvents always manage to get money again from somebody else?—But not these cultivators.

38,971. Would you say that the number of moneylenders is increasing?—It is not increasing, because most of our moneylenders who resided in rural areas have gone to the towns and cities and have taken to other professions.

38,972. In this district do the cattle dealers sell cattle on credit?—Yes, they do.

38,973. And take instalments?—Yes.

38,974. So that they also are a source of credit?—Yes, they are, and they perform very useful work in that way.

38,975. At a price?—Yes.

38,976. Do goldsmiths act as pawnbrokers?—Sometimes; very seldom.

38,977. *Mr. Kamat*: You have said that the first object of primary schools should be to equip the boys for their life work and that literacy should be a secondary object?—Yes, because literacy will increase their efficiency, but they must get work first and then they must be efficient workers; therefore, literacy must occupy the second place.

38,978. But if you do not make them literate you will not raise their level of intelligence, and they will not be able to understand such things as the laws of sanitation, hygiene and improvements in agriculture, which they should read about?—I do not say that literacy should be discarded altogether, but that should be the secondary object; the main object should be the development of agriculture, which they should learn for earning their livelihood, and for that they must be educated so that they shall do their work more efficiently than others.

38,979. Is this the ideal or the objective which your District Board places generally before itself about primary schools?—At any rate that has been the objective since I have become the Chairman of the District Board.

38,980. Speaking about District Boards, you said the difficulty was about taxation?—Yes.

38,981. Supposing you have not sufficient finance, was any attempt made to sound the members as to whether new schemes of taxation should be pushed on in the interests of the people?—It will have to be done, but that point has not been specially urged yet; but it will have to be done very soon, say this year or the next.

38,982. Are you feeling the pinch of finance for various improvements?—Yes.

38,983. For roads and other things?—Yes, for roads, for schools and also for agricultural education. There are now twelve vernacular middle schools, and I want that there should be agricultural classes opened in at least five of them; zamindars are supplying fields for that purpose.

38,984. You have had the Compulsory Primary Education Act introduced in this Province quite recently?—Yes.

38,985. Is any serious effort being made to give effect to it in opening schools?—Not till now, but the schemes are under the consideration of Government.

38,986. I know rules are being framed, but the time is near at hand when you should be thinking of raising funds if you want primary schools?—Yes.

38,987. Is there any attempt made in your District Board to do that?—Yes.

38,988. New taxation will have to be imposed?—Yes, and unless we impose taxation we shall not be in a position to make an effective demand from Government.

38,989. And as Chairman of the District Board you are inducing your friends and colleagues to be prepared for further taxation; is that the attitude?—Yes.

38,990. *Sir Henry Lawrence*: You are anxious to see a degree in agriculture established in the University?—Not exactly a degree in agriculture, but I want that agriculture should be made one of the subjects for the B.A. and M.A. examinations.

38,991. You do not want to have a separate degree in agriculture?—No. The diploma examination of the Cawnpore College is quite sufficient for that purpose.

38,992. The Cawnpore College is turning out men with a high knowledge of agriculture?—Yes, in scientific and practical agriculture.

38,993. You do not want anything more than that?—No. But people from Agra and other distant places cannot go to Cawnpore though they want to learn practical agriculture for their B.A. and M.A. examinations.

38,994. How will that be taught?—Instruction can be given on farms attached to the University or to the College.

38,995. Where will these farms be? I do not quite understand your scheme?—These farms should be attached to the constituent colleges of the University.

38,996. Every college will have a farm?—No; the farm should be established where there is an effective demand for it. If the college is situated in a place where the number of landholders is very large, there will be an effective demand for agricultural education; then there should be a farm attached to the College of Agriculture and agriculture should be taught as one of the subjects for the B.A. and M.A. examinations. For instance, in Agra and Meerut, where there are colleges, the number of well-to-do agriculturists is very large.

38,997. Has a similar scheme been adopted in any other Province till now?—I do not know.

38,998. There is a scheme before the University for the creation of a Faculty of Agriculture, is there not?—I am not aware of any.

38,999. If there were such a scheme and if it required any assistance in the shape of money from the Legislative Council, would it receive that support?—Yes, it would.

39,000. That is a different scheme to the one which you advocate?—Yes.

39,001. Still it will receive support?—Yes.

39,002. Are the big landholders in this part of the country taking interest in improved agriculture?—Yes.

39,003. Have they got tube-wells?—They have not got tube-wells because the water is at a very great depth.

39,004. What sort of depth?—About 60 or 70 feet.

39,005. Does not the tube-well go down so far?—Not in this place.

39,006. It cannot go down to 60 feet and get the water?—No, it cannot.

39,007. Why not?—It has not been tried anywhere this side. One tube-well has been put in the tahsil of Kerwadi, where the water level is not very deep; but it has not proved a success and it has not been tried anywhere else.

39,008. On what is your information based that tube-wells will not go as far down as 60 feet?—In the existing condition of Agra I think they will not work well; but I have no knowledge of that. Only one has been tried, as I mentioned, and it has proved a failure.

39,009. Have you adopted any improved methods advocated by the Agricultural Department on your lands? Have you tried any new crops or improved crops? Do you consult the Agricultural Department and follow

their advice?—Yes. One variety of cotton and two or three varieties of cane have been adopted generally in the district of Agra and they are replacing the indigenous varieties, for instance, cotton No. 19 (Aligarh) and the Coimbatore canes.

39,010. You find some profit in them?—Yes, especially round about the cities where thick cane is sold for chewing purpose.

39,011. Have you yourself derived pecuniary benefit from those ventures?—I do not own any farm at present.

39,012. You are a landowner, I suppose?—Yes, landowner in the sense that I collect rent from the tenants.

39,013. You do not farm any land yourself?—Not at present.

39,014. So you derive no personal benefit from improved agriculture?—No; I do not own any land myself; I have let it out to the cultivators.

39,015. Is that a more paying proposition?—I have been living on rent, especially for the last six or seven years.

39,016. It is all rented out?—Yes.

39,017. And you derive good profit from that?—We take rent from the tenants.

39,018. *Sir Ganga Ram*: You were farming your own land up till six or seven years ago?—Yes.

39,019. Why did you give it up?—On account of domestic reasons.

39,020. Are you now practising as a lawyer?—No.

39,021. You are an LL.B., are you not?—Yes.

39,022. But you are not practising?—No.

39,023. You are Chairman of the Agra District Board?—Yes.

39,024. What is the income of your District Board?—Rs.4,29,000.

39,025. Out of that, how much do you spend on communications?—About Rs.65,000 a year.

39,026. Out of that amount, again, how much do you spend on metalled roads and how much on unmetalled roads?—On unmetalled roads we spend about Rs.9,000 and the rest we spend on metalled roads.

39,027. Do you get any contribution from the Provincial Government towards communications?—At present we do not get any contribution. We are applying for a Government grant for a certain road.

39,028. Are your communications in good order?—Yes; but they are not sufficient.

39,029. Are all the unmetalled roads properly bridged?—No.

39,030. The first thing to do is to bridge them?—Yes; but it will cost a good deal and we cannot find money for that purpose.

39,031. Have you got to bridge only minor streams or are there major streams?—They are only local seasonal streams, and they are entirely dry during the cold season and the hot weather.

39,032. How is your family governed, by the Hindu law of inheritance or by the law of primogeniture?—By the law of primogeniture.

39,033. Why is it so?—We have been settled in this part of the country for a long period and we are always governed by the law of primogeniture.

39,034. Are the other landholders also in the same position?—No; the Hindu law governs them.

39,035. Under what law is your partition governed?—By the customary law, the *kulachar*.

39,036. Are there any other landholders who are so lucky as that?—There are several.

39,037. Can anyone declare himself to come under that?—Yes; they can apply to the Government that the Agra Estates Act may be applied to them. There are two parts to the Act; under the first part the law of primogeniture applies to them, and under the second their properties become inalienable.

39,038. What is the date of that Act?—About 1920; I am not quite certain about it.

39,039. It is a new law?—Yes.

39,040. *Sir Henry Lawrence*: Does this law apply to all members of your community?—No.

39,041. What is your community?—Rajput.

39,042. Which kind of Rajput?—Jadou Rajput.

39,043. Do all Jadou Rajputs have the law of primogeniture?—Yes.

39,044. It applies to your family?—Yes.

39,045. To how many other families does it extend?—Two or three families.

39,046. Has that been recognised in the Courts of Law?—Yes.

39,047. *The Chairman*: Has it ever been tested?—It has been contested, too.

39,048. *Sir Thomas Middleton*: I think you said you had about 700 teachers under your Agra District Board?—Yes.

39,049. You would like to get 300 of these instructed in agriculture?—Yes, in practical agriculture.

39,050. You would send them to school for three months, to the Bichapur farm?—Yes.

39,051. You use the expression "off and on"?—Yes.

39,052. What is your idea? To send them at what time?—To see the seasonal operations, sowing, harvesting, and so on.

39,053. To see the full process of growing crops?—Yes; they will have to go there about ten times a year.

39,054. Would it not be very difficult for them to get away from their school duties?—We can make arrangements for replacing them for such a short period; the work of the teacher who goes to the school for training can be done by one of the other teachers.

39,055. Is it your intention that these teachers should work with their own hands while they are on the farm?—Yes; they should also know how to use the improved implements, how to open them and how to mend them when they get out of order.

39,056. Do you think that you can teach the schoolmaster to mend the implements in three months? You may be able to teach him how to use the implements, but I hardly think he would be able to learn how to mend them?—I do not mean to say that he should be able to mend the implements. He would be able to open the parts of the implements and see what parts have been broken. The implements will no doubt have to be mended by carpenters and blacksmiths.

39,057. What is your idea as to the amount of instruction that children should get from the teachers? What time do you consider these children would have to spend in learning agriculture from the teachers?—They should learn agriculture in the morning and in the evening, that is to say, before the school opens and after it closes. They should be taken

to the fields and interest should be created in them through practical, ocular demonstrations.

39,058. Is it your belief that if the teachers went to the farms they would be able to get an insight into, and acquaintance with, the working of the Agricultural Department?—Yes.

39,059. And they would be able to tell the children about what was going on in the Province for improving agriculture?—Yes.

39,060. You mentioned agriculture as being a suitable subject for the B.A. How many subjects has a student got to take in his final year?—Three subjects.

39,061. And agriculture would be only one of those three subjects?—Yes.

39,062. You could not, I take it, expect a student to be examined on as extensive a syllabus as if he had passed through, e.g., the Cawnpore College?—Not exactly so much.

39,063. Are there any parts of agriculture which you think would be suitable for the B.A.?—Practical agriculture with an elementary knowledge of science.

39,064. Would it not be useful if, there again, some course were provided on the work of the Agricultural Departments in India, what they have accomplished, the history of the movement in India, and how India has progressed in the last thirty or forty years? Do you not think that it might be possible to introduce some such subject into the B.A. course?—No; that should be introduced in the M.A. course; for the B.A. course practical agriculture might be quite sufficient.

39,065. If you take practical agriculture as one of the three subjects, then the student will never get it up in time?—I think practical agriculture will be quite enough.

39,066. You mention the fact that cattle dealers sell cattle on credit. What sort of terms do they give? Suppose they were selling a pair of bullocks for Rs.200, what kind of repayments would they exact?—There is no uniform rate; it is done on the easy instalment system.

39,067. Do they pay Rs.10 a month, or how much?—No; the whole payment is made within two or three years by instalments.

39,068. What sort of total payment would they require if the original price of the bullocks was, say, Rs.200? Would the total payment amount to something like Rs.400?—Not so much.

39,069. Would it be Rs.300, then?—The interest is included in the price; the interest would be about 2 per cent. per mensem.

39,070. *Mr. Calvert*: The interest is not disclosed?—It is disclosed, but that is included in the price.

39,071. A lump sum price is made and no interest is disclosed?—Yes.

39,072. *Sir Ganga Ram*: You said a little while ago that the spring level of the well is something like 60 to 70 feet below the ground? How many pairs of bullocks do you use to draw water from that depth?—In some places we have to use two pairs, but generally one pair is used.

39,073. For eight hours?—Even less than that.

39,074. How many acres of land can you command by that system?—I cannot say exactly, because the people take to other methods as well.

39,075. Have the people of this district complained about the deficiency of water, and, if so, have they tried boring? I am not talking about tube-wells, but the ordinary wells?—It has not been extensively tried here.

39,076. Has the Agricultural Department not advised you about that?—No.

39,077. *Mr. Kamat*: In answer to Sir Henry Lawrence, I think you said that you had given out all your lands to the tenants and that you collected rent. Were these lands given out on tenancy for life or were they given out on short terms?—There is no period short of life, because life tenancies have been created in our Province. There are occupancy tenants and ex-proprietary tenants and the holdings descend to the sons and successors.

39,078. So that even if you have a desire to introduce new improved methods of agriculture, you have not the power to resume these lands and therefore you are helpless under this system of tenancy?—Yes, that is so; but we can apply to the Collector for the acquisition of any particular land and if the Collector is satisfied that we really require the land for introducing improved methods of agriculture, then he will acquire the land for us.

39,079. So that the Collector has the power to help you to resume the land if you wish to introduce improved methods?—Yes; but we would then have to pay compensation at the rate of six times the rental value of the field.

39,080. On the whole, therefore, the tenancy system is a hindrance to the introduction of improved methods of agriculture on the part of the talukdars?—We cannot do anything ourselves; the Collector's intervention is always necessary, and before he does so, we would have to make an application to him.

39,081. If an attempt were made to liberalise your tenancy systems in the new Legislative Councils, to make them more democratic, would that sort of proposal be received with favour by either the talukdars or the tenants or by both? Public opinion is not ripe for it; am I right?—It has got to be democratised no doubt.

39,082. Then what would happen?—I do not quite follow your question.

39,083. Supposing we wish to make tenancy less rigid than it is at present? —In what respect?

39,084. So that the land could be resumed on short periods or the tenants can effect improvements with benefit or something like that?—Then the zemindars in one case would welcome such a proposal because it would be to their interest.

39,085. But the tenants in that case would be equally opposed to it, so that it would be a very vexed question?—Yes.

39,086. *The Chairman*: As Chairman of the District Board of Agra would you tell us what the Board has done for agriculture?—We have applied to Government for sanction to put my scheme into practice.

39,087. Anything else?—No.

(The witness withdrew.)

BABU ADIRAM SINGHAL, Singhal Dairy Farm, Agra.

Replies to the Questionnaire.

QUESTION 4.—ADMINISTRATION.—(c) (ii) Railways.—The railway arrangement so far as it affects the dairy industry is hardly satisfactory and is not calculated to give as much impetus and adequate encouragement to the same as is desired for the following reasons:—

(1) Oilcake is a staple food for milch cattle, and constitutes also an excellent manure. It is therefore of paramount importance to retain all the available cake within the country and to facilitate its transport from place to place. For the same purpose unrestricted export of oilseeds out of the country is a dead loss and hence undesirable. A glance at the railway tariff rates on oilcakes and oilseeds will suffice. At present the said rates are so anomalous that it is cheaper to transport those commodities to port towns than to places in the interior which are less distant. The rates should be revised and should almost be reversed so as to produce the desired effect.

(2) Another impediment to the development of the dairy industry is that the railway rates are almost prohibitive on dairy products, such as milk. There is no facility for the cheap and quick transportation of milk from areas where it is abundant to places where the supply does not keep pace with the demand. For instance, I have a milk business at Agra which is quite successful. I formed the opinion that the demand for milk in Agra in the hot and rainy seasons much exceeds the supply, and the Tarai area of the Naini Tal district at that period has plentiful milk which can be well utilised to meet the demand of Agra, but for transport facilities. I approached the R. and K. Railway and the B.B. and C.I. Railway authorities through the Director of Agriculture and requested them to grant some concession in carriage as is done by the E.I. Railway Company. But they refused point blank. Such an unsympathetic attitude is highly detrimental to any sort of progress.

(3) Another equally important point is the crying need for refrigerated wagons. In a tropical country like India, transportation of milk and fruits is impossible without cold storage. And the railway companies will do well to make arrangement for refrigerated wagons for certain articles to prevent deterioration due to the intense heat. It is short-sightedness of the railway companies in grudging the initial outlay on this special class of rolling stock, for in no time they would realise a huge income when the trade develops owing to increased transport facilities.

(4) Another source of complaint is the rough handling and pilferage on railway lines. This is a more enormous obstacle than can be imagined. The mischief goes on and has been going on unchecked and the inattention of the railway companies to the representations made to them on this point is almost criminal.

(5) The railways are also very careless about the carrying of dairy cattle. Cattle are huddled together without any regard to hygienic conditions and the capacity of the wagons. And, worst of all, loose shunting is effected in a most irresponsible way, which causes injury to the animals and the death of some. It is a heartrending sight and should be stamped out as soon as possible, also on economic grounds. These conditions cause a serious deterioration of milch cattle in particular and entail incalculable loss.

(iv) *Meteorological Department.*—The activities of this department do not benefit the cultivators [illegible]all, as they ought to. The yearly forecast and the daily reports are [illegible]uctive of much good if timely communication is made to the cultiv[illegible] But there is no such arrangement The best method would be that the local meteorological laboratories should disseminate such information within their localities and make it available to the culti-

vators. It is a far cry from Simla to the plains below and their obscure hamlets, and the results of the department should be broadcasted in poster forms in the vernacular, even in the smallest village.

QUESTION 8.—IRRIGATION.—(*b*) The distribution of canal water to cultivators is in many respects thoroughly unsatisfactory and requires speedy reform. The following difficulties are noteworthy:—

(1) Canal water is not available at the opportune time, when crops require it.

(2) The cultivator has no fore-knowledge of the amount of water that will be supplied by the canal during the season, and is not in a position to make selection of crops according to the water requirements.

To remedy this the Canal Department should work under instructions from the Agricultural Department with respect to the running of canals, and should set out and publish a seasonal programme which should be approximately correct and an accurate monthly programme which should be strictly adhered to. Unless this be done, the water supply cannot be to the best advantage of the cultivator.

QUESTION 14.—IMPLEMENTS.—(*b*) The obstacles to the use of improved implements are that:—

1. There is no satisfactory demonstration of their working on the fields of the cultivators.

2. The prices of most of the implements are prohibitive and beyond the slender means of the cultivator.

3. Joint purchase and co-operation is not successful.

The remedy that can be suggested is the adoption of the hiring out system. The Government should demonstrate the use of implements on the cultivator's fields instead of on the Government farms, and then give the free use of these implements to the cultivators for a year at least in order to drive home the utility and value of the implements to their conservative and sceptic minds. After that, a nominal rent on the use of the implements should be assessed and made chargeable at the harvest time.

For this purpose Government should establish depôts in every tahsil and hire out implements. The work will be facilitated if the Government gives some sort of subsidy to the manufacturers, who can start their own depôts, or to the leading farmers and zamindars who can undertake the work of hiring out implements, if it is made worth their labours. In the beginning nobody is going to do the work *gratis*, much less when it is likely to cause some loss. So the manufacturers, farmers or zamindars should be encouraged properly by the Government with subsidies and concessions. As soon as the work becomes a paying concern, Government can withdraw its support. The cane crushing *kolhus* may be cited as the best example of hired implement and work remarkably well. The *kolhu* has indeed pioneered the way and is of immense benefit to the farmers, as well as to manufacturers who are not slow to realise their interest and push forward any prospectively successful implement.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Improvement of the breeds of the livestock is a matter of sovereign importance, and is not receiving that amount of attention which it deserves, either from the Agricultural Department or from the public. The milch cattle and draught cattle have both deplorably degenerated, and have very prejudicially affected the effective tillage of the soil and the health of the people. The improvement of the breeds mostly depends upon the selection and maintenance of excellent bulls for covering. The present stray bulls in the villages are worthless, and they are further deteriorating the future stock. They are badly treated, and are in law *res nullius*, i.e., the property of nobody and can be caught, beaten or even killed; so the Government should make a selection of choice bulls and maintain them in different localities on an extensive scale. No bull not approved by the Agricultural Department should be allowed to be

used for covering, and those that are so used should be subjected to very close periodical inspections by the department. In the beginning, the Government will have to procure and supply selected stud bulls, but it no longer should be anxious for their upkeep. It may be suggested that a covering fee is levied. I dare say that from the proceeds of the fee sufficient money will be coming forth to meet the maintenance charges of the bulls. It would be desirable if the Government were to work in co-operation with the District Boards and lodge the bulls in cattle pounds in the charge of cattle yard clerks.

Side by side a good pedigree herd should be raised by the Agricultural Department, and when a good number of animals are available, the former bulls should then be replaced by the latter ones.

(ii) India is a purely agricultural country. It is strange and even disgraceful that a country with its traditions and unbounded reverence for the bovine species should depend upon the foreign supply of dairy products.

At present the dairy industry, as far as milk is concerned, is in the hands of *gowalas* in almost all the big cities. But the conditions under which they are producing milk are most insanitary. The dairy farms started in the cities to supply milk under hygienic conditions have not proved an economic success. The result is that the milk supply in cities is very defective, and consequently condensed milk is imported. If, however, the dairy industry is started on the lines I have done, I am sure it will gain a sound economic footing, and will go a great way in effectively solving the problem of the milk supply of great cities, which is the crying need of the day.

Under my scheme the cattle are not kept in the cities. Selected milch animals are procured and given to the cultivators in the villages adjoining the cities. The milk is purchased from the cultivators, milked by my own men under strict supervision into proper dairy utensils, and collected under hygienic conditions at a place in one central village. Then it is pasteurised and refrigerated if necessary, filled and sealed in cans, and then transported to the city morning and evening for marketing as such.

Under this scheme the advantages are:—

1. It is cheaper to keep animals in villages than in cities.

2. It does not require any additional labour on the part of the cultivator. He can keep one or two milch cattle along with his bullocks. His wife and children can take care of them.

3. The risks of famines, diseases, &c., are divided. One man alone will not have to bear the whole risk.

4. This will be an additional source of income to cultivators besides agriculture.

5. The fertility of the land will be increased as the animals will be reared on cultivated lands.

6. Milk is produced under more natural conditions than those obtaining in cities.

The zamindars and agricultural graduates can very well take up the scheme. It has proved equally profitable to the producer, the dealer and the consumer.

QUESTION 20.—MARKETING.—(*a*) I would confine my remarks to the marketing of milk alone. Under the present system, it is very difficult for the honest dealers in milk to compete with the dishonest ones. The customers cannot easily distinguish pure and good milk from adulterated milk, and consequently go in for any milk which they can get cheap. Thus the dishonest dealers, taking advantages of the ignorance of the customers, flourish to the detriment of honest ones. Under such conditions, the honest dealer and, consequently, the industry, cannot prosper. To put the industry on a sound footing, it is necessary that some standards should be fixed whereby the customers may be able to know the value of the commodity for which they pay.

Oral Evidence.

39,088. *The Chairman*: Babu Adiram Singhal, you have provided us with a note of your evidence. Would you like to say anything in addition to that at this stage, or shall we ask you some questions?—I wish to say something, first, under the heading of agricultural indebtedness.

39,089. Would you like to put that in in the form of an additional statement?—Yes, I would like to make an additional statement.

39,090. We can take that statement at the end of your oral evidence. Perhaps first of all you would tell the Commission a little about your business. Do you own land?—Yes.

39,091. And you carry on a dairying business on your own land?—No, I am carrying on a milk business and I have got an agricultural farm on my own land.

39,092. Those two things are quite separate, I take it?—Yes.

39,093. Would you describe your dairy business to us? You have nothing to say in addition to what you have set down on page 611 of your note?—If you wish I shall describe it in detail.

39,094. You say on page 611: "Selected milk animals are procured and given to the cultivators in the villages adjoining the cities." When you say "given to the cultivators" do you mean given to them free?—I give buffaloes to them on advances; I purchase the animals from the Punjab and bring them here.

39,095. You bring them here at your own expense and you give them to the cultivators and charge them the cost price and they pay back in instalments?—No, they give me the milk instead.

39,096. Do they sign a contract when they take the animal?—No, I do not have anything of the sort; the transaction is done orally.

39,097. Do you make any bargain with them as to the manner in which they are to feed these animals?—No; but generally I look to the health of these animals.

39,098. Do you control the fodder that the animals get?—Yes, I give them fodder if they have not got it; and I also give them cake, gram, etc.

39,099. And you charge them for it?—Yes.

39,100. And do they pay in cash?—No, only in milk.

39,101. But who shoulders the risk in case the cow dies?—Generally the cultivator has to run the risk, but if he has only newly begun to give me milk and if I find him really poor, then only do I take the risk. Whenever a cultivator's animal dies, I have got to give him another animal.

39,102. And then they have to pay for the new animals as well as for the dead animal?—Only one case like that has occurred during the last four years.

39,103. Do your milkers go round and milk?—Yes, I have got many milkmen, and supervisors to supervise these milkmen.

39,104. How many cows can each milkman milk?—I have not limited the number of the cows; but generally two and a half maunds of milk are drawn every day by each pair of milkmen and supervisor.

39,105. How many cows does that require?—That would depend on circumstances; it varies at different times. When there is a less output of milk the number of animals must necessarily be larger.

39,106. Yes, I gather that; but I wanted to know what the average was? Would it be about 30 cows?—Yes, I think it would.

39,107. What does the cultivator get out of this bargain?—There are some cultivators who have now got their own animals. They have paid me back the price of the buffaloes that they purchased from me.

39,108. And that is their only chance of making anything out of it?—Yes. Then again when they have paid me back and they require money for other purposes, such as buying seed, then I give them advances without charging them any interest.

39,109. How long have you been carrying on this business?—For the last four years.

39,110. How many cows have you out with cultivators at the moment?—The number of cows is less, but I have a great number of buffaloes; I have about 200 buffaloes.

39,111. How many cows?—Not more than 15 cows.

39,112. In those four years how many cultivators have paid off all the charges and acquired full possession of a buffalo or a cow? Can you give us any idea?—I think a minor portion of them have given back the money.

39,113. Can you give us any idea of how many?—They take money from me, and when they have paid about half of it they take more money for other purposes; the general difficulty with which I am faced is that when a cultivator has paid back all my money, other moneylenders who have lent them money fifteen or twenty years back come in, and I have to provide money for those people.

39,114. I am not sure I understand the scheme; I do not understand where the attraction from the cultivator's point of view comes in; he seems to me to get nothing until he has paid you the value of the animal in terms of milk, and he seems to shoulder all the risks of disease, which are not inconsiderable in this country?—No, that is not the case; to my mind they are gaining a great deal.

39,115. What type of cultivator is taking these animals?—Almost all the people in the village have got animals from me.

39,116. In the country districts round about?—No, three villages are controlled by me.

39,117. Do you own the land?—Yes.

39,118. Can you account at all for the fact that cultivators are willing to take your buffaloes or cows under this scheme?—Yes, they are always prepared to take buffaloes.

39,119. What is the attraction to them?—The attraction is that they can pay back in milk very soon.

39,120. But I thought you said a minority had succeeded in doing so in the last few years?—But they go on taking money from me continuously.

39,121. What do you pay them for the milk?—8 seers for a rupee.

39,122. From the very start?—Yes.

39,123. *Sir Ganga Ram*: And at what rate do you sell the milk?—I sell at 3½ annas a seer.

39,124. *The Chairman*: When you start with a new cultivator, he takes your buffalo, he pays for the food and gives it shelter, and your men milk it; is that right?—Yes.

39,125. You value the milk he brings to you at the rate of 8 seers to the rupee?—Yes.

39,126. He gets no cash until he has paid the value of the buffalo?—Yes, and he has money whenever he requires it for marriages or to pay back other moneylenders.

39,127. What rate of interest do you charge for the money which you lend him?—I do not charge him anything as long as he gives me milk.

39,128. You lend him all the money he wants?—Yes. Of course, I look to the type of cultivator; if he is not in a position to repay, I will not lend him money.

39,129. On page 609 of your note, paraphrasing your words, you say that a glance at the railway tariff rates on oilcakes and oilseeds will show that the varying rates discourage the internal consumption of these commodities and encourage export. Is that your theory?—Yes.

39,130. Could you quote one or two of those rates to the Commission?—Yes; the rate from Agra to Ludhiana is 8 annas per maund on oilcakes, whereas from Agra to Bombay the rate is 9 annas, though the latter distance is much greater.

39,131. *Professor Gangulee*: Are you quoting railway risk rates or owner's risk rate?—I do not know, but these two rates are not different; I think they are both at owner's risk.

39,132. *The Chairman*: They are strictly comparable in your opinion?—Yes, they are.

39,133. They are for the same service?—Yes.

39,134. *Sir Henry Lawrence*: What are the two distances?—I think the distance to Ludhiana cannot be more than 500 miles.

39,135. *The Chairman*: Then, on page 609, I see you say that in a flush season when you had a surplus of whole milk for sale you suggested to the R. and K. Railway and the B.B. and C.I. Railway authorities through the Director of Agriculture that they should make some concession in the matter of rates as is done by the E.I. Railway Company. What concession were you thinking of?—I want reduced rates on milk and milk cans on return journeys.

39,136. That is to say, full and empty?—Yes.

39,137. Do you have to pay for the return of empties in this country?—Yes.

39,138. What concessions did the East Indian Railway Company make?—The East Indian Railway Company charges very low rates on milk in cans and returned milk cans; the charges are about 7 annas per maund for 200 miles, but in Agra the charges come to about Rs.1-7-0 from Lalkua to Agra.

39,139. What size of churn do you use for this transport?—10 gallons, but for this purpose I intend using insulated cans.

39,140. To keep the milk cool?—Yes. There are other points I have written about, pilferage and rough handling.

39,141. Do you lock your churns?—I seal them. I have not yet begun importing from Lalkua. The trouble is that they handle the cans very badly; these insulated cans will not stand more than a fortnight's journey in the way they are being handled.

39,142. What is the insulating material?—I do not know what the insulating material is; they are probably imported from Germany; I purchased them from Messrs. Keventer.

39,143. I suppose the fact is that there is so little milk transported that the railway servants are not accustomed to handling the churns?—I think Mr. Keventer is already importing a lot, but still they do not handle them properly.

39,144. You suggest the railway companies would do well to make arrangements for refrigerator wagons for certain articles to prevent deterioration.

No doubt you realise that the railway company is bound to consider the financial aspect of any proposal of that sort. Then in paragraph 5 on page 609, you make a complaint about the carelessness of the railway company's servants in the matter of dairy cattle when they are being transported?—Yes, that has been the case with my own cattle; the trouble is that they detain the cattle for a long time at junctions. From Rohtak to Agra is a very short distance, but the first wagon I got from there arrived here after eight days. It is really very difficult for one attendant to look after eight buffaloes and eight calves.

39,145. You speak of loose shunting?—Loose shunting is going on recklessly. On one occasion one of the calves jumped out of the wagon and one of them died on the way; almost all the buffaloes I got from my first wagon were half dry; they did not give me as much milk as they ought to have done.

39,146. *Sir Henry Lawrence*: For how many miles did it take eight days?—I think it is 150 miles.

39,147. *The Chairman*: On any one consignment of buffaloes and calves can you tell the Commission with accuracy how many animals were either killed or damaged?—It was only in the first wagon that I had so many animals damaged.

39,148. What did the wagon contain?—Eight buffaloes and eight buffalo calves, and there was only one attendant.

39,149. Of the eight she buffaloes were any damaged?—No; but the buffaloes were much deteriorated in condition.

39,150. What happened to the eight calves?—One of them jumped out of the compartment and one died.

39,151. Is it possible for them to jump out of the wagons provided for the transport of livestock?—Yes. If the door is shut entirely there is no ventilation in the wagon. The wagons are of just the same type as for the goods trains; there are no special wagons for animals.

39,152. They are closed in roofed wagons, are they?—Yes.

39,153. And the only ventilation is through the door which must be kept half open?—Yes.

39,154. Is that accurate?—Yes.

39,155. Have you ever sent your animals in horse wagons?—No.

39,156. You could send them in horse wagons, but that would be more costly?—Yes; the cost will be prohibitive.

39,157. Are you growing any fodder?—Yes.

39,158. What fodder are you growing?—*Juar* and oats.

39,159. How are you disposing of that fodder?—I feed my cattle with it and I dispose of it to the cultivators.

39,160. Are you preserving any fodder at all?—Yes, as silage. I have got silage pits. I always keep 2,000 maunds in stock.

39,161. Do you find that the cultivators who work according to this plan of yours keep any milk or milk products for their own consumption?—They keep it on occasions, for marriages, feasts and so on.

39,162. Ordinarily they do not consume any milk products at all?—Those who have paid off my money can do so, if they like.

39,163. *Professor Gangulee*: Do we understand that you do not allow them to keep any milk?—In the beginning I do not allow them to keep any milk.

39,164. Even if they wanted to?—Yes; but on occasions they can.

39,165. *The Chairman*: On page 610 of your note, you are suggesting that the proper way for the Government to encourage the distribution of improved implements would be to "give some sort of subsidy to the manufacturers, who can start their own depôts, or to the leading farmers and zamindars who can undertake the work of hiring out implements, if it is made worth their labours." You do not suggest that there was any subsidy or concession behind the popularising of the cane-crushing plant, do you?—No, I do not.

39,166. *Sir Henry Lawrence*: Of what breed are your cows?—Rohtak breed.

39,167. You have never tried any cross breeding with English bulls?—No.

39,168. *The Chairman*: What happens to the calves of the she-buffaloes or cows under the charge of the cultivators?—They take them themselves.

39,169. What happens, for example, if the she-buffalo has a calf? Do you take the calf or does the cultivator take the calf?—It is the property of the cultivator.

39,170. Do you charge him for that?—No, not at all.

39,171. *Sir Ganga Ram*: What happens to the cow or buffalo when it goes dry? Does the cultivator keep it at his own expense?—Yes.

39,172. Generally, how long does it take for a cultivator to pay you for one animal?—In case he does not take any money from me he will pay the amount within one lactation period.

39,173. How much milk does a buffalo give?—10 to 14 seers.

39,174. For 10 seers he gets Rs.1-4-0; then he has to feed the animal. What is the cost of feeding the animal?—He himself grows the fodder; that he does not take into account. Then there is generally an old man in the family who collects weeds from the fields.

39,175. They give the weeds to the milch cattle?—Yes; there is a kind called *katiya* which they give.

39,176. Does he give any gram?—Yes, gram and *juar;* that is the custom in these parts during the winter season.

39,177. Do they give *binaula* (cotton seed)?—No; they give it only to those animals the milk of which is made into *ghi*.

39,178. You do not make *ghi* out of your milk?—No, not at all.

39,179. Have you made any representations to the Rates Advisory Committee which has recently been started?—No. I intend making representations to them.

39,180. They recently came to Delhi?—I did not know that.

39,181. Does Mr. Keventer feel the same difficulty about the import of these things which you suggested?—I think he has got some facilities in this respect.

39,182. Those facilities have not been given to you?—No; they are specially given to Mr. Keventer; he perhaps imports his animals in passenger trains.

39,183. Did you apply for those facilities?—No; but I am quite sure that I would not get them. I enquired from him about this and he said it is because he has been importing them for a long time that he has got these concessions.

39,184. Have you studied the question of milk canning as an industry, just as we get from Denmark?—No.

39,185. *Sir Thomas Middleton*: Were you at Cawnpore College or any other college?—I studied in the Poona Agricultural College.

39,186. Had you any experience in this milk business before you came up to Agra?—No. This is my own scheme that I am carrying out, my own original scheme.

39,187. You were not engaged in the industry in Bombay before you came here?—No.

39,188. You employ your own milkmen to milk the cows and buffaloes; is it the duty of these men to see that the cows and buffaloes are properly fed?—It is not always their duty, because I am staying in the village myself. Generally, when an animal is not well fed, the other cultivators bring complaints to me and I go and see the animal.

39,189. Why should the other cultivators bring complaints to you?—One has got several enemies in the villages, and the enemies of the cultivator concerned come to me and complain.

39,190. The buffalo depends on the enemy for proper feeding?—The cultivator has a duty to perform; but I do not tax him to that extent.

39,191. Supposing a buffalo is getting as much fodder as it can take and is giving about eight seers of milk in the day. How much do you expect the cultivator to give in the shape of oilcake and other things?—About two seers of gram and one seer of *juar*.

39,192. You expect him to give that?—Yes.

39,193. And if you find that he is giving half of that quantity you would at once find fault with him?—I would give him *juar* and gram instead of paying him any money. When I find that they are not feeding the cattle well, I stop paying them money and give them gram and other things.

39,194. You control the treatment of the cattle in that way?—Yes, to some extent; not absolutely.

39,195. You have told us that cultivators have got to return to you all the milk that the buffalo gives until they have paid back about half the value. What happens to the calf?—The calf is their property.

39,196. But does the calf never taste milk?—It does; otherwise, how can it survive?

39,197. That is what I ask myself, because you take all the milk?—All the milk that is left after the calf gets its share.

39,198. You do allow them to bring up the calf?—Yes.

39,199. What arrangement have you made as to the amount of milk that the calf has to get?—There is no definite rule laid down. It is allowed as much as the cultivator allows it.

39,200. *The Chairman*: The more milk the calf gets the longer it will take the cultivator to pay you off?—I leave it to the discretion of the cultivator.

39,201. *Sir Ganga Ram*: Who takes the benefit of adulterating?—Nobody.

39,202. Do you use the lactometer?—It is absolutely useless.

39,203. *Sir Thomas Middleton*: Do you use the Gerber method?—Yes: I keep a record of each herd that the milkman handles.

39,204. One milkman milks from 20 to 30 buffaloes; how do you test the milk?—Over each milkman I have got a supervisor, and over these two there is another man who supervises them. A sample of each is taken, and that is regulated by the visits of the general supervisor.

39,205. You talked about growing *juar* and oats on your own land. Do you mean fodder *juar*?—Yes.

39,206. Have you any special kind of fodder *juar* in this district such as they have in Bombay?—No.

39,207. You just use the ordinary *juar*?—Yes.

39,208. Have you made up your mind as to whether you prefer green *juar* or green oats?—I prefer the green *juar;* and I make pit silos.

39,209. Have you ever had cases of poisoning in feeding with green *juar*?—Only one buffalo calf of mine died.

39,210. *Sir James MacKenna*: What are your views on the indebtedness of the cultivators? Do they get out of debt at all?—It is very difficult for them to get out of it. Marriages and similar functions take away a lot of the cultivator's money. They do not have the money for these marriages and such like festivals, with the result that they have to borrow money at exorbitant rates of interest. The rate of interest being very high, they are unable to pay back the principal and they simply go on paying the interest.

39,211. They never make any effort to pay the principal, do they?—They try to do so, but when the interest is so high they cannot afford to pay back the money. At least with my milk scheme it has been possible for them to pay back some of the money borrowed from moneylenders. But the trouble is that the moneylenders come very unexpectedly, once in a year or even after two years, and no sooner one moneylender is paid than another comes, and the cultivator has got to pay this man as well.

39,212. Have they any documents or papers to show what they actually owe to the moneylender?—The moneylenders have documents, not the cultivators. But the trouble is this, if the cultivator has taken a loan of, say, Rs.100 and has paid back Rs.60 out of that loan, he has not got any receipt for that amount, so that the moneylender again takes into account the original sum of Rs.100 lent and the interest on it.

39,213. Is there any prospect of the cultivator ever getting out of debt at all?—I think so. That is only possible provided the cultivator is given *taccavi* loans. But these *taccavi* loans should not be paid to them at seasonal times. The *taccavi* loans should be given in monthly instalments, otherwise they are prone to spend the money recklessly.

39,214. That would mean a complete revision of the principle of the Act, and that method of disbursement would considerably increase the cost of the disbursement of *taccavi*?—Yes, but that is the only solution of the whole trouble, because if you give them the money in a lump sum they will spend it recklessly.

39,215. Without any regard for the future?—Yes.

39,216. They do not worry about paying it back, do they?—No.

39,217. Can their lands be attached?—I do not know. I think that his own land can be attached, not the occupancy land, provided, of course, in the latter case the zamindar is willing to let the land be attached.

39,218. *Professor Gangulee*: Have you graduated from the Poona Agricultural College?—Yes.

39,219. When did you graduate? In 1919?—Yes.

39,220. And after your graduation you started this work?—Yes, a year after.

39,221. You sell your milk in the city of Agra?—Yes.

39,222. Are you a licensed vendor?—There is no system of licensing.

39,223. You are able to sell your entire output at the rate of 4 annas per seer?—No, at 3½ annas per seer.

39,224. Do you pasteurise your milk?—No, I have not yet done so. I intend to purchase a machine and to pasteurise the milk in the next hot season. It is not needed in the cold weather.

39,225. How do you manage now?—At present I cover the can with a *khadi* cloth.

39,226. Has *khadi* any special virtue in pasteurising the milk?—I cover the can with a coarse *khadi* cloth and then pour water over it; on the way the *tongawallah* sprinkles water over the can and the temperature of the milk is lowered by the evaporation of the water on the covering, with the result that the milk is kept good for a long time.

39,227. *The Chairman*: Do you swing the can, or have a current of air passed over it after you have covered the can with a wet cloth?—No, the *tongawallah* sprinkles it on the way two or three times; there is no swinging done, it remains in the *tonga*.

39,228. *Mr. Kamat*: *Khadi* is suitable because it is thick like a towel?—Yes.

39,229. *Professor Gangulee*: You collect all the milk from the neighbouring farmers?—No; the village is eight miles away, and I collect the milk from within a narrow radius of the village.

39,230. And you bring your milk in *tongas*?—Yes.

39,231. You do not use the railway?—No, not at present. I intend using the railway for bringing milk from Lalkua.

39,232. I thought you said that insulated cans were broken in transit by railway?—I said that they will break owing to the rough handling of the railway people.

39,233. And you yourself have never any loss?—No, but I have seen this rough handling myself.

39,234. Your experience at the moment is confined only to the *tonga* method of collection?—Yes.

39,235. Would you give us a little more details of your organisation for collecting milk from your cultivators? How do you collect your milk? When does your morning milk supply reach the Agra city?—At 5.30 in the morning.

39,236. That milk is the evening milk, is it?—No, that is the morning milk. The milking begins at midnight. A bell is rung so as to inform the villagers round about that they must be ready with their animals.

39,237. Are these villages within a radius of eight miles?—They are within a radius of two miles from my village.

39,238. And they are eight miles from Agra?—Yes. With each milkman there is a bucket and a collecting can and with the milkman there is also a supervisor. These two men go to each cultivator and milk the animal in our own utensils, at the same time measuring the quantity of milk milked. In this fashion they go on collecting the milk from place to place. After all the milk has been so collected, it is brought to a central village, called Itara, where it is first passed through the Ulex milk strainer to remove any dirt which may have collected therein. It is finally sealed in cans and sent to the city, and here it is sold in hand carts.

39,239. On page 611 you say: "The dairy farms started in the cities to supply milk under hygienic conditions have not proved an economic success." Do you handle your milk under strictly hygienic conditions?—Of course I do.

39,240. You do not pasteurize?—Pasteurization alone does not mean hygienic conditions. I have got special utensils to deal with it; then

again the animals are kept quite clean when the people are about to milk them.

39,241. So that this is a remark based on your own personal experience?—Yes.

39,242. And it has not proved an economic success?—My business is an economic success.

39,243. But you say that the dairy farms started in the cities have not proved an economic success?—I mean dairy farms kept within the city limits.

39,244. You do not have any cattle under your own direct management?—At times I do have.

39,245. You distribute to the cultivators the fodder that you grow and the silage that you preserve?—I have taken to silage preparation only from this year, and it is only for the last month or so that my animals are having the benefit of it.

39,246. Do you get any supply of oilcakes?—Yes, we have got an oil mill and we get our oilcakes from it.

39,247. *Mr. Calvert*: What about the covering of the buffalo cows? Do you keep a special bull?—I have got a Murrah bull from the Government farm.

39,248. Are you taking an interest in the breeding of these buffaloes?—Yes, as I have got a bull I am taking an interest in them. The breed is improving and this bull is controlling about ten villages in my vicinity.

39,249. Will you not have to change that bull soon?—No.

39,250. To prevent it covering its own offspring?—I do not think I shall have to change the bull.

39,251. I understand that these buffaloes become the property of the cultivator even before he has paid for them?—Of course, they will become his property if he pays back the remaining portion of my money either in cash or in milk.

39,252. Does the property remain with you until he has paid off the loan?—The property remains with him.

39,253. That is to say he has to pay for it on the instalment system?—Yes.

39,254. Are the buffaloes ever attached by moneylenders in execution of decrees?—Yes, they are attached. I do have cases of this sort where the buffaloes are attached by the moneylenders. But I have one distinct advantage. Mr. Pragnam, who is the leading lawyer of this place, is a relation of mine and as all the moneylenders are afraid of him, naturally they do not trouble me.

39,255. So you do not suffer any loss on that account?—Of course, I am not suffering any loss, but I am afraid of them. I think myself that some legislation might be introduced for this purpose. The cultivator, at any rate, is a loser in this respect.

39,256. Do you guarantee the purity of your milk?—Yes.

39,257. Do you use preservatives?—No.

39,258. Who buys this milk? Indian or European gentlemen?—I think there are some European gentlemen too who buy the milk.

39,259. Who are the majority of your purchasers?—Indians.

39,260. *Mr. Kamat*: In this system of yours of placing these animals in charge of the cultivators without obtaining any written documents from them, and depending throughout on their good faith, both in taking

the milk from them and in giving them the cattle food, are you not more or less following unbusinesslike ways?—Yes, it is unbusinesslike.

39,261. Supposing any other man who had no facilities or who had no lawyer friend such as you have, were to invest, say, Rs.20,000 in 200 buffaloes and were to distribute the animals among 200 cultivators and simply depended on their word for the milk and the upkeep of the cattle, would not such a man be entirely at the mercy of these people?—Yes, not only at the mercy of these people, but also at the mercy of the moneylenders.

39,262. You say this system could be copied by other people at a profit?—That is what I am giving to the tenants, and if others like to do so they can have written documents from the tenants.

39,263. If you begin taking written documents, will the system work as well as it is working in your case?—Of course it will; the cultivators have no objection to giving documents.

39,264. You say the system also works to the advantage of the consumer. I want to know how that is the case? You are selling milk at 3½ annas a seer?—Yes.

39,265. What is the ordinary rate from the *gowalas*?—Four or five annas. In some cases it is 2½ annas in Agra itself, but that depends on the purity of the milk.

39,266. Then you are selling in some cases cheaper than the other *gowalas*?—Yes; when I started my work the price of milk throughout the city was 5 annas a seer.

39,267. You have brought it down by half an anna?—No; generally in the city it is 3 annas and even 4 annas; in places where my cart does not reach it is 5 annas.

39,268. We are told that the method for checking adulteration of milk would be by some sort of legislation or licensing by the Municipalities. In the Agra Municipality is there any check on adulteration?—No, there is none, but I intend suggesting something.

39,269. Supposing municipal law or legislation is introduced to check adulteration, what would be the effect on the milk market?—If adulteration is absolutely stopped, the first difficulty in the market will be that most of the people who are now selling milk would shut down and there would probably be an increase in the price of milk.

39,270. To what extent?—I cannot say.

39,271. Will the price be prohibitive to the ordinary middle-class man or the poorer man?—It all depends on the strictness of the legislation; if the legislation is very strict and is immediately enforced throughout India, I think prices will go very high, but if it is applied gradually from district to district and there is some other organisation to supply pure milk, then the price may be kept down. In Agra, where you have another organisation to supply milk, the prices will be all right, but in other cities, if you check adulteration, there are people who will shut down and who will not engage in this business when they see that adulteration has been checked, and then prices are sure to rise high.

39,272. Would the checking be very effective? How many supervisors would the Municipality have to employ?—I doubt the honesty of the supervisors.

39,273. Would prosecutions be successful?—I do not know. The prosecutions will be quite successful if they are honestly done; it all depends upon the character of the supervisors.

39,274. You spoke of the moneylenders and their system by which they do not give any receipts for repayments. Do you not think as long as the cultivator is illiterate he will be unable to protect himself?—Of course, he will not be able to protect himself as long as he is illiterate and no receipts are given.

39,275. But some mitigation of the nuisance might be effected by legislation; for instance, there should be account books with printed pages and a penalty should be imposed on moneylenders who do not give receipts?—I think there is already a provision for a penalty if the moneylender does not give receipts.

39,276. But that is not insisted upon by the borrower, because he is always in need of money?—One difficulty is, that if you invent a substitute for the moneylender, the moneylender will at once require the repayment of his money, and the cultivator will be left at the mercy of God.

39,277. That means that the borrower needs the moneylender with all his tricks?—Yes. I have seen cases in which the cultivator only takes Rs.20 from the moneylender, but the moneylender gets a document from him for Rs.50.

39,278. So that his need is such that he puts himself in the hands of the moneylender with his eyes open?—Of course he does, when he has no other means of satisfying his needs.

39,279. Have you any suggestion to make with regard to this?—The only suggestion I have to make is that the cultivators must not get money in a lump sum; if they get money in a lump sum, they are sure to misuse the credit that is given to them.

39,280. That is owing to illiteracy and lack of intelligence?—You cannot change that state of things quickly; it will take a long time to educate them to that extent.

39,281. When you give them advances in lump sums, what happens?—I do not give them advances in lump sums; I generally give them advances in accordance with their requirements.

39,282. In fact, you suggest giving driblets of Rs.5 or Rs.10?—Yes, not more than Rs.20.

39,283. *Professor Gangulee*: Do you not take any document from them for the money you give them?—No, I do not, because I have got good facilities; the cultivators have complete faith in me, and I have great faith in the cultivators.

39,284. *Mr. Kamat*: And there is the great dread of your relative?—Yes.

39,285. *Professor Gangulee*: Do you know of any city in which municipal inspection is working efficiently?—I do not think it is working efficiently anywhere.

39,286. What is your total output of milk?—This year it is 10 maunds a day.

39,287. Your suggestion is that 10 maunds of milk in the City of Agra has affected the position so much that it has reduced the rate from 5 annas to your price?—Yes.

39,288. *The Chairman*: Can you give us any indication at all as to how many cultivators have succeeded in paying off the value of the animals obtained from you? Have 50 succeeded in doing so?—I cannot say accurately how many. I think about 40 have succeeded in paying back.

39,289. 40 in four years?—Yes.

39,290. I think you want to make a statement now?—The first thing is that milk should be licensed; the sale of adulterated milk must be allowed to go on, but there must also be licensed milk.

Babu Adiram Singhal.

39,291. You mean certificated milk guaranteed by the Government?—Yes.

39,292. That milk would be subject to inspection?—Yes, it would be inspected by the milk chemist periodically, once in a fortnight at least, and he must publish the analysis of the milk.

39,293. Is that to ensure value for quality to the producer?—Yes; it will ensure the quality of the milk for those consumers who can pay a good price and at the same time are intelligent enough to realise the value of good milk.

39,294. It will ensure quality to the consumer, but is it also the idea that it will ensure value for quality to the producer?—No. Take, for instance, my own milk which I am selling at 3½ annas a seer; what I mean is that in Agra there must be two grades of milk: licensed milk "A," and licensed milk "B"; the fat percentage must be the determining factor; milk containing over 7 per cent. of fat must be classed as Grade "A," and milk containing from 6 to 7 per cent. as licensed milk "B"; the milk must be sold in the market under those classifications. Any milk which does not contain 6 per cent. must not be classified as licensed milk. The chemist, when he has analysed the milk, must publish the result in poster form in the city so that the educated consumer may know the quality of the milk that is offered; otherwise we shall not be able to compare our milk with that of dishonest traders. The difficulty we are in is that these people are selling separated milk here and they say the testing machine gives good readings with it.

39,295. What is your next point?—The vegetable *ghi* that is coming into India is adversely affecting the dairy industry; this year the price of *ghi* has fallen to 12 *chattaks* a rupee, which, I think, is due to the sale of this vegetable *ghi*. This means a loss to the cultivators and the dairying industry is becoming unprofitable.

39,296. What suggestion have you to make?—To my mind the importation of this vegetable *ghi* into India must be absolutely prohibited by a very prohibitive duty being put on it. In Agra the Municipality has imposed an import duty of Rs.25 per maund on vegetable *ghi* imported into the city; but the trouble is that *ghi* is being imported into the rural areas, and they are adulterating pure *ghi* with it and bringing it into the city.

39,297. I think you have given us your views about indebtedness. Your point was that *taccavi* loan should be disbursed in small amounts?—Yes.

39,298. *Sir Henry Lawrence*: Is this vegetable *ghi* injurious to health?—I cannot say it is, medically, but I think it is injuring the health of the people; most of the people have an objection to it.

39,299. What is it made of?—Vegetable oils, olive oil. My brother is an expert in this industry.

39,300. *Sir Ganga Ram*: I understand you to say it is mostly used, not in its pure state as it is imported, but for adulteration purposes?—It is used almost always for adulteration purposes.

39,301. *Sir Henry Lawrence*: You say it is imported?—Yes, it is all imported.

39,302. Is it not also made inside India?—Yes, it is made in India, and that should be prohibited too, because it is filling the pockets of a few men at the expense of the whole of the cultivators in India by decreasing the consumption of ordinary *ghi*. There are people who object to taking *ghi* because they cannot rely on its quality.

39,303. *Sir Ganga Ram*: Some of it is said to be made from coconut oil; on what grounds can you prohibit that? If you can prove it is used

for adulteration, then there is some case for prohibition?—But can you not stop it on economic grounds?

39,304. *Sir Henry Lawrence*: Are you proposing to compensate the people who make this substance?—I think they must be compensated, and then the production should be stopped absolutely.

39,305. *Mr. Calvert*: Is petroleum jelly used to adulterate *ghi*?—I do not know.

39,306. *Sir Ganga Ram*: Is emulsified petroleum also used to adulterate *ghi*?—I do not know.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Friday, the* 18*th February,* 1927, *at Delhi.*

Friday, February 18th, 1927.

DELHI.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries.*)

Mr. R. OAKDEN, I.C.S., Commissioner, Meerut Division.

Replies to the Questionnaire.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) (1) *The distribution of improved seed.*—This is usually done from seed depôts. There are complaints of delay, especially when grain is supplied on *taccavi* terms, and of supply of poor quality seed.

A case of this kind came to my notice recently in Saharanpur, where the Collector saw the seed (wheat) and found it inferior to locally obtainable seed. Another complaint is that the grain obtained from improved seed is not up to the standard of the parent seed, and deteriorates at each successive harvest.

(2) *The adoption of the Persian wheel.*—This has been most successful in parts of the western districts of the Province and is spreading. It is better for the bullocks, saves the labour of one man and is cheaper. Quite an industry in making iron wheels and iron buckets to replace the old wooden wheels with earthen pots is spreading in some towns, e.g., Saharanpur, Nakur in Saharanpur and Shamli in Muzaffarnagar.

(3) *The use of improved ploughs.*—The iron plough supplied by the Agriculture Department is becoming popular. Actual figures for its supply can be given by that department.

(*b*) Demonstrations to be really effective must be made in the villages so that cultivators may see the results of improved methods side by side with those of the old methods.

(*c*) Cultivators are willing enough to follow expert advice if they are satisfied that it is sound. Mere preaching without demonstration is useless.

Instruments, seed, &c., might be supplied free or at reduced rates to approved men who are willing to experiment with them in their own villages.

QUESTION 4.—ADMINISTRATION.—(*c*) (iii) Agriculture in this Province suffers from lack of good roads and insufficiency of roads. Many villages are ten miles or more distant from any recognised road, and are dependent on village tracks. Unmetalled roads are generally very bad and are very difficult to keep in repair.

Repairs can only be done effectively at the end of the rains before the ground has dried. They are usually done too late, if at all, and the dry earth thrown down is quickly pulverised and blown away.

The breaking of culverts owing to failure of repairs is becoming serious.

Village roads or tracks connecting villages with recognised metalled or unmetalled roads are extremely bad and are under no system of control or management. They belong nominally to the owners of the villages through which they pass, but they are mostly uncared for and neglected. Occupiers of adjoining fields encroach on them and cut them or traverse them with irrigation channels. They are frequently below the level of the fields and become watercourses in the rains, and if they are cut or damaged by traffic or running water there is no authority responsible for their repair. Such repairs as have to be done are usually done by cartmen whose carts cannot otherwise proceed.

There are two remedies:—

(1) The extension of recognised roads.

(2) The formation of some local authority.

QUESTION 8.—IRRIGATION.—In 1921 a scheme for increasing the supply of water in the Betwa canal, Jhansi, was drawn up, but I do not think that it has ever materialised. It provided for catching the surplus water of the river Betwa by the construction of a second *bund*, and seemed a sound and desirable scheme.

QUESTION 10.—FERTILISERS.—(*e*) There are several kinds of nitrates on the market, but they are not much used. Some kinds can be made in India, and are cheap enough for a small landholder. From 1 to 3 maunds are required per acre, and the cost of a maund of sodium nitrate, calcium cynamide and sulphate of ammonia is about Rs.9 at Saharanpur. They could probably be sold cheaper if Government would interest itself in the manufacture and distribution. The use of some kinds is tricky, and cases have come to my knowledge in which damage has been done either by using too strong a mixture or by using it without sufficient irrigation. The simpler kinds only should be popularised and full instructions should always be given.

Mr. W. M. Griffith, Executive Engineer, Eastern Jumna canal, Saharanpur, is much interested in nitrates and is carrying out experiments. I suggest that he be asked to prepare a note for the Royal Commission.

QUESTION 19.—FORESTS.—(*b*) More use should be made of canal banks for trees.

QUESTION 22.—CO-OPERATION.—(*a*) (i) In 1925-26, I was president of a committee* of enquiry into the co-operative movement in the United Provinces. The committee's report has been published. The chapters and paragraphs quoted in my answers below relate to this report.

Government (Chapter XIV) should help—

(1) By declaring and making it clear that co-operation has its strong support. This was done in the Punjab and was one of the causes which led to the success of co-operation in that Province. I might add that Sir Michael O'Dwyer in his book on India attributed the prosperity of the Punjab to three causes—canal irrigation; the Land Alienation Act, and co-operative societies.

(2) Financial aid. This must be liberal if success is to be achieved, and can best be given in the form of an efficient staff for controlling, guiding and supervising societies. Strictly speaking, co-operative societies should provide for their own supervision, &c., but in India, unlike other countries, co-operation was started by Government and, therefore, can fairly expect Government aid in control and supervision. In the United Provinces less public money has been spent on co-operation than in any Province (paragraph 88).

(3) By concessions (paragraphs 89 and 90).

(4) By loans (paragraph 61 and 91).

*Report of the Committee to enquire into the Co-operative Movement in the United Provinces (Oakden Committee's Report), 1926.

(5) By instructing the officers of all departments, especially District Officers and their assistants, to encourage the movement (paragraph 92).

Many officers do not know what co-operation is. To remedy this, Government should supply them with a few simple books.

(ii) Non-official agencies, in which I include Municipal and District Boards, should help—

(1) Generally by increasing facilities for primary education and by improving road communications.

(2) By encouraging the formation of societies among their employees and by encouraging school teachers to assist the movement as secretaries or members of societies. Teachers in this Province usually take no interest in local societies, though they could do much to remove that at present necessary evil, the group secretary.

(3) By depositing their surplus cash and provident funds in Central Banks and by accepting deposit receipts in lieu of cash deposits from contractors and employees. (Paragraph 93.)

(4) By contributing to the pay of organisers and supervisors. (Paragraph 93.)

(*b*) (i) Most of the societies in the United Provinces are credit societies, and a considerable part of the committee's report relates to such societies, *vide* Chapters II, III, IV, V, VI and VII. My views about them are given in paragraphs 10, 15, 22, 23, 24, 27 and 29.

(iii) Societies formed for the sale of produce or stock. (Paragraph 58.)

(v) Societies for the consolidation of holdings. (Paragraph 54.)

(vi) Societies for the co-operative use of agricultural machinery. No such societies exist in the United Provinces, but their formation is recommended. (Paragraph 52.)

(viii) Cattle-breeding societies. One such society was formed in the United Provinces, but failed. (Paragraph 48.)

(*c*) Compulsion by legislation is contrary to the co-operative spirit. I am opposed to it in theory, but, if experience shows that the views of the majority are frequently thwarted by a small minority, legislation might be desirable. If there is such legislation, the law should provide that the minority to be coerced should be very small.

(*d*) My experience, which is based mainly on inquiries made by the Co-operative Committee and on statements made before it, is that they have in the main not achieved their object in the United Provinces. Failures are numerous, and a lack of vitality is manifest. If benefits had been more real the movement would have spread by its own momentum, and, after a life of over twenty years, it would not still require so much outside stimulation. (Chapters II, III, IV, V, VI, VII, VIII and IX.)

Oral Evidence.

39,307. *The Chairman*: Mr. Oakden, you are Commissioner of the Meerut Division?—Yes.

39,308. Amongst other services you were Chairman of the Co-operative Committee of the United Provinces of Agra and Oudh which sat in 1926?—Yes.

39,309. Have you had any other direct association with the co-operative movement?—None except as a District Officer.

39,310. To what extent in your view is the District Officer responsible, in a broad sense, for the economic development of his district?—He used to be regarded as the initiator of everything in the district, but that in the later days is beginning rather to pass away.

39,311. Do you regret the passing of that view?—Yes, I do in a sense. The District Officer is becoming more divorced from the actual life of the

people owing to the creation of non-official District Boards and the development of other departments and so on. It is inevitable, I suppose.

39,312. Do you not think that during the stage of transition it is important that District Officers should be encouraged to keep up their interest in the economic well-being of the population as long as possible?—I certainly think it is most important.

39,313. You do not think that one of the immediate effects of the Reforms is to tend to make the District Officers to lose sight of that responsibility a little before they need have done?—I think it was so in some cases but I do not think it is universal.

39,314. It must take time before the District Board, for instance, and all the machinery of representative Government can come to mean very much to the individual cultivator?—Yes. The Reforms came at a very unfortunate time. They came into being during non-co-operation when it was considered quite wrong to go and consult the Collector. There is a great change coming over them now, and we now find that the District Officers and Commissioners are consulted very much more by Boards and individuals.

39,315. The political conditions of the moment tended to harden the line between the new representative system and the Collector system?—The new Boards wanted to disregard the Collector and to stand on their own feet; they have now begun to find that they cannot do so in very many cases and they now begin to welcome the help and advice of the District Officer much more than they did three or four years ago.

39,316. To turn to your note, is there anything that you would like to say at this stage in addition to that which you have written in your note of evidence?—I do not think I have anything extra to say.

39,317. There are no corrections in the printed note which you wish to make?—No.

39,318. With regard to seed you say: "There are complaints of delay, especially when grain is supplied on *taccavi* terms, and of supply of poor quality seed." Have you ever heard of any charges of corruption in relation to the conduct of these depots?—No; I have not heard of any charges of corruption.

39,319. There has been no suggestion that seed of inferior quality and value was being issued as improved seed?—No; I have never heard of it in that form, i.e., that it was due to direct dishonesty.

39,320. On page 625 of your note, you point out that agriculture suffers from lack of good roads and insufficiency of roads. You are thinking of roads in the charge of the District Boards?—Yes, mainly, except when I speak of village roads.

39,321. Are the District Boards in financial difficulty?—More or less; but they are always very ready to spend money on things on which they want to spend. They do not like to spend money on roads for some reason.

39,322. Do you think that it is within the power of District Boards, if they choose, to levy the necessary taxation to give such revenue as they require to discharge their duties and responsibilities?—In the case of some Boards it would be quite impossible.

39,323. The money is not there?—No, the money is not there; they largely depend on Government grants. That would apply specially to all hill districts and in the case of others it really depends upon what degree of efficiency is to be attained.

39,324. Is there great reluctance to levy taxation in some cases?—Yes, there is. At the same time a good many Boards in the United Provinces

are beginning now to apply the tax on "circumstances and property," without which they are not allowed to raise the cess. It is a sort of general property tax. If they introduce that tax then they are allowed to raise the cess.

39,325. What is the definition of "circumstances" when used in that sense?—It means a tax on the man's general condition, and practically almost comes to income-tax.

39,326. *Dr. Hyder*: Is it not really paid by the people who are below the income-tax limit?—It is leviable on every one.

39,327. But in the districts generally there are a number of people whose incomes are above Rs.2,000; they get all the benefits and pay nothing? —Yes; but this tax is leviable also on those who pay income-tax in addition to their income tax. It is purely a tax levied by the Local Boards.

39,328. *Sir Henry Lawrence*: Has the word "circumstances" any legal definition?—It is one of the well-known taxes in this Province.

39,329. Is it an old term in this Province?—Yes, it is. It is a tax on the man's general well-being.

39,330. *Sir Ganga Ram*: Is there any limit to it beyond which it is not levied?—I have forgotten whether there is actually any limit to it; but the rules have to be sanctioned by the Government and a limit is always applied.

39,331. *The Chairman*: Does any particular class in fact control the District Boards in the rural areas in the Province?—The power is getting into the hands of the small landholder in some places at any rate.

39,332. Not the big man?—Yes; in areas where the big man is powerful he can still hold his own; but I think the bulk of the members belong to the small landholding class.

39,333. Will the tax on "circumstances and property" fall mainly on these small landholders?—No, it would not fall on them at all, because income from land which is subject to land revenue is not assessable; they pay a tax in the cess which is a tax based on the land revenue.

39,334. So that, perhaps, it is not surprising that a body which is mainly controlled by small landholders favours this particular tax?—They do not favour it; but it is the necessary preliminary to increasing the cess. It is meant to fall really on the money lending and trading classes of the agricultural area.

39,335. Let me put the question directly. Is there disinclination on the part of small landholders who have power on District Boards to tax themselves and to make a fair contribution towards the expenses of the Boards?—It is not very noticeable.

39,336. *Sir Henry Lawrence*: The disinclination is not noticeable?—There is a general disinclination to introduce taxation because it is unpopular. The members keep an eye on future votes and do not like to do anything unpopular. At the same time a good many Boards are beginning to introduce this tax. Three out of the five districts in my Division are introducing it. The tax on "circumstances and property" is a preliminary to increasing the cess.

39,337. *Sir Ganga Ram*: What is the translation of "circumstances"?—It is *haisyat*.

39,338. *The Chairman*: You say it is a preliminary to increasing the cess?—Yes.

39,339. How soon does the increase in cess follow?—They have got to do it by a separate resolution, but it is supposed to follow at once. We have not so far actually raised the cess anywhere.

39,340. That is for the local expenditure?—Yes.

39,341. Is it the case that where the tax on "circumstances and property" has been levied and where the increase in cess has not followed, the small landholder makes no increased contribution?—It is too early to say that the cess would not be increased. No Board in my Division has yet begun to collect this new tax.

39,342. If you accept by hypothesis that is so, is it?—Yes, I think it would follow.

39,343. Automatically?—I think it is intended to follow.

39,344. *Sir Henry Lawrence*: On what is that based?—It merely increases the percentage of the cess.

39,345. Do you think an additional cess on land is likely to follow?—Yes.

39,346. Is there any agreement with the Local Board that the Government will not sanction the tax on "circumstances and property" unless an additional cess is levied on land?—I do not think it is part of any agreement.

39,347. It is just your opinion of what would be the probable result?—Yes; because otherwise it was feared that they would all raise the cess as it is a very easily-collected tax, which Government collects and credits into the Treasury with the land revenue.

39,348. Who entertained the fear that they might give further taxation to themselves and not tax the trading community?—The Government.

39,349. Government were afraid that they might tax themselves and not the traders?—Yes, because it is so much easier to raise the tax.

39,350. *The Chairman*: On page 626, in answer to our Question 10 about fertilisers, you suggest that Government should interest itself in the manufacture and distribution of certain chemical fertilisers, that they might be sold at a cheaper rate to the cultivator. On what did you found yourself when you suggested that? Would you like to see Government embark in this field?—In India, I do not think anything new will progress unless Government helps it; it wants Government help to start, and that is the general idea upon which it is based.

39,351. Are you familiar with the campaign that is going on at the moment for popularising fertilisers in India?—I have only a very general knowledge of it. I know that certain companies are trying to popularise them.

39,352. Do you know that in the matter of seed distribution many persons in responsible positions in the Agricultural Departments are most anxious that private enterprise should take up the business of seed distribution?—I should myself agree with them, not only in regard to this, but also in regard to everything else, if they could only get it done.

39,353. *Professor Gangulee*: Are you thinking of a Government subsidy in the manufacture of fertilisers?—I am thinking not so much of a Government subsidy as Government help and encouragement.

39,354. *The Chairman*: At the top of page 627, you suggest that, in order to give officers an opportunity to teach themselves co-operation, Government should supply them with a few simple books. Do you mean paying for existing books or having new books written?—No, I meant existing books.

39,355. Does that chime with the practice of the service? Do officers expect to be provided with books on subjects of this sort?—I think if they were not supplied most of them would not get them, and if they got them it would be rather difficult in many cases to get them to read the books.

39,356. It is hardly a point for Government distributing them?—No, it would not be, but still it would help.

39,357. I do not know whether you would wish to put before the Commission anything on co-operation which is not contained in the Report that is generally referred to by your name?—I do not think so.

39,358. It struck me that in the matter of the future policy as to the granting of *taccavi* loans and their effect on co-operative credit, you might wish to say something. Do you hold that Government should pursue a policy of granting *taccavi* loans only through co-operative credit societies where those societies operate?—Not only through them.

39,359. Even in districts where credit societies are active?—I would not limit it to that.

39,360. Probably it is within your knowledge that there are some persons who hold the view that that limitation should be imposed. You do not think that *taccavi* loans are apt to compete with credit societies if the practice that you suggest is followed?—I do not think so.

39,361. *Sir James MacKenna*: You had no connection with co-operation before this present Committee?—No.

39,362. Might I ask what general impression did you get of the co-operation movement in the United Provinces apart from the conclusions expressed in the Report?—As is stated towards the end of the Report, it was stagnant and entirely lacking in vitality.

39,363. The general impression which you formed was a feeling of disappointment; is that so?—Yes.

39,364. Had you that impression as a District Officer before you embarked on this particular enquiry? What impression did you form of it as a Collector and as a Commissioner?—My impression of it was much better when I began the enquiry than when I ended it; that is with regard to the United Provinces.

39,365. Do you think that at this stage another general enquiry on the lines of the Maclagan Inquiry (which is now nearly twenty years old) into the whole movement in India, would be a sound thing, assuming that other Provinces may have the same conditions as you discovered in the United Provinces?—I do not feel qualified to answer that question; but I think probably on the whole it would be, although the circumstances have altered in that the subject is now a provincial " transferred " one.

39,366. Your Committee did not approve of the idea of appointing a Development Commissioner, but suggested the creation of a Board to co-ordinate the activities of the Agricultural, Co-operative and Industries Departments. Has that Board been formed?—I do not think so.

39,367. What was your idea of the composition of that Board?—I do not think we have entered into any details.

39,368. Do you think that agriculture and co-operation should be under one departmental head?—I think myself that it would be very good for co-operation if they were.

39,369. That would be a biggish job, would it not?—Yes, it would be. Of course, indirectly they come under the same Minister, but that does not really co-ordinate them.

39,370. I think the United Provinces Government definitely turned down the proposal?—That question was still pending when we reported, because it was one of the points they asked us to mention.

39,371. *Professor Gangulee*: Did you find in the course of your inquiry that there was adequate co-operation between departments such as Agricultural, Industries, Co-operative Societies, and so on?—Co-operation was certainly lacking.

39,372. And your suggestion for a Board, to which Sir James MacKenna has just referred, was made with the idea of bringing about the desired co-ordination?—That was the hope.

39,373. Are you not aware of the Provincial Development Board that was set up by the United Provinces Government?—I do not know anything about its activities; it must be an Industrial Development Board as far as I remember.

39,374. You think that the formation of a Board would help to bring about the co-ordination that you seek?—Yes, I think it might.

39,375. Under one Minister?—It would want something more than the Minister to bring them together. As you will see from the note of the Director of Agriculture which we published, the Co-operative Department was given up by him in disgust. He said that he could not do anything with them because they were useless.

39,376. Could you tell us why the suggestion for a Development Commissioner was turned down by the Government?—I do not know.

39,377. In your inquiry what was the chief trouble in the matter of supervision? Was it inadequate supervision or was it imperfect supervision?—Both inadequate and imperfect.

39,378. We were told that the centralisation of authority in the Central Banks is largely responsible for the lack of vitality in the co-operative movement with regard to primary societies. How would you bring about decentralisation of authority without losing the efficiency in management? Have you any alternative suggestions to make?—We think that it ought to be taken away from the Central Banks.

39,379. Would you set up another organisation for supervision on the lines of the guarantee unions which exist in Burma?—I do not think that anything will be really effective except a strong official staff at present. Ultimately some other form of control may be developed.

39,380. Do you see any indication of village panchayats being interested in the co-operative movement?—They are in certain places, indirectly. We have not got any regular panchayats in the United Provinces.

39,381. Have you not panchayats of the co-operative societies?—Yes.

39,382. Do you know of any primary society in the United Provinces where the secretary is the village schoolmaster?—There are a very few; the village schoolmaster as a rule has kept entirely aloof and no effort has been made to bring him into the movement.

39,383. Why has he kept himself aloof from this movement?—I do not think anybody has bothered about him.

39,384. Do you think he could possibly be utilised for the improvement of the primary societies?—It would be necessary to interest him in co-operation first, and no attempt has been made to do so.

39,385. What is the attitude of the landholders towards the co-operative movement?—They are not hostile to it; they are, generally speaking, friendly.

39,386. What is the attitude of the District Boards?—The District Boards care nothing for it and have no concern about it at all.

39,387. What is your view on the question of land mortgage banks in the United Provinces?—My views are those which we put in the Report.

39,388. You do not think the time has come for establishing land mortgage banks?—The time has not come in the United Provinces to start any new thing on co-operative lines; we have got to build the foundation much firmer before we can start anything new.

39,389. With regard to the training of the co-operative officials, would you prefer to have graduates from the agricultural colleges?—Yes, I think that would be very sound indeed; but they will want a co-operative training as well.

39,390. On page 626, you mention two remedies: the extension of recognised roads and the formation of some local authority. What have you in mind when you speak of the formation of some local authority? Do you want to have a District Road Board or something of that sort?—It would have to be something infinitely smaller than that, something more like a combination of a few villages. These roads get cut and knocked about and no one repairs them; no one thinks it is their job to do it; there is no authority to do it at all.

39,391. And you want that authority to be invested in a small committee of the District Board; is that it?—No, I would cut the District Board out of it altogether.

39,392. Who is going to have this authority?—Either the village or a combination of villages.

39,393. It is not quite definite in your mind?—I have not formulated a definite scheme.

39,394. *Mr. Calvert*: On page 16 of your Report you give a list of the main defects in the organisation of co-operation, and you put the failure to explain the principles of co-operation at the very end?—Yes.

39,395. Is that put there in order of importance?—No, it was not in any order.

39,396. Would you put that first in order of importance?—Yes, I think I should put it first.

39,397. On page 30 of your Report, you say the study of rural problems should occupy a far higher place than it does among the interests of the Co-operative Department. Do you consider the study of rural problems as carried out in the Punjab would be useful in the United Provinces?—I think it would be most useful.

39,398. You told Professor Gangulee that the United Provinces required a strong staff?—Yes.

39,399. Were you thinking there of a staff strong in numbers or strong in co-operative training?—Strong in co-operative training, and certainly numerically stronger than it is now.

39,400. The main thing would be a better trained staff?—Yes.

39,401. You have more or less recommended the Punjab system of training for the staff in these Provinces?—Yes; I think we recommended it very strongly.

39,402. You had before you one of our Assistant Registrars as a witness, Sardar Ikbal Singh?—Yes.

39,403. An ordinary Jat, but an M.A. in economics?—Yes.

39,404. Do you think that if you had that type of man in these Provinces you would be able to make a better success of co-operation?—Yes, I am sure we could.

39,405. *Sir Henry Lawrence*: Have not you got Jats in these Provinces?—Yes, but unfortunately our Co-operative Department is mainly recruited from the towns; that is one of its difficulties; I do not think we have got a single Jat in the whole department.

39,406. Have you got any Jat M.A.'s?—Yes, and we have quite a number of Jat Deputy Collectors and Superintendents of Police; they are available all right.

39,407. *Mr. Calvert*: You had the opportunity in the Punjab of seeing the staff there?—Yes, I saw a fair number of the staff.

39,408. And I think you formed a favourable impression?—Yes.

39,409. That is the kind of staff you are advocating for these Provinces?—That is the kind of staff I had in my mind.

39,410. On page 626 of your evidence, with regard to financial aid, you say financial aid can best be given in the form of an efficient staff for controlling, guiding and supervising societies. I notice that you miss out the word "educating"; did you really mean to include education?—That omission was not intentional; I would certainly add the word "educating."

39,411. Would you say the best way Government can aid this movement is by providing an adequate staff for educating the people in co-operative principles?—I think I would add these other points; it all comes to much the same thing.

39,412. But is not the idea of education to dispense with the need for control, guidance and supervision?—It is ultimately; I was thinking more of present conditions.

39,413. *Mr. Kamat*: I wish to ask you a question by way of comparison between the position of the co-operative movement in the United Provinces and in the neighbouring Province of the Punjab. You agree that the Punjab is ahead of the United Provinces in co-operative matters?—Yes, vastly.

39,414. In both Provinces the departmental agency is practically the same, the law, I mean the Co-operative Act, is just the same, the position of the Local Boards is practically the same. How do you explain the phenomenon that in one Province the co-operative movement is so stagnant while in the neighbouring Province it is so far ahead?—It is mainly due to the fact that in the one Province it was guided and led by men who understood and knew co-operation, while in the United Provinces it was not.

39,415. *Professor Gangulee*: It is chiefly due to the personnel of the movement?—In the one there was a body with brains behind it while in the other there was a body with no brains behind it.

39,416. *Mr. Calvert*: I hope the Punjab is the one that had brains behind it?—Yes. When I say "brains," I mean knowledge of co-operation.

39,417. *Mr. Kamat*: You mean that in the United Provinces there is not the zeal for ensuring progress in the co-operative movement; that is what you mean by lack of brains?—It is lack of knowledge rather than lack of brains; the Co-operative Department from the Registrar downwards do not understand co-operation.

39,418. On page 627, you say Government should help by instructing the officers of all departments, especially District Officers and their assistants, to increase the strength of the movement, and you say "many officers do not know what co-operation is." Does that apply to all District Officers?—It applies to most of them; it certainly applied to me personally when I began this enquiry.

39,419. At the beginning of your remarks in answer to the Chairman, you said that at the present moment and at the present transitional stage after the Reforms the District Officer does not feel himself responsible for the economic development of the villages, and he is divorced from them?—Not so much as he was.

39,420. Has this attitude something to do with the lack of progress in the Co-operative Department in the United Provinces?—I do not think so.

39,421. Is that the general mentality also of the members of the Co-operative Department, that they feel they are not directly responsible for

the welfare of the villages?—I do not think they have any ideas of rural uplift; I do not think they have any ideas outside the societies.

39,422. With your experience on this Committee and also as a District Officer, do you think this uplift could be brought about mainly by Government agency, even if the District Officer were to be supposed to be entirely responsible for rural welfare? I mean, supposing with regard to rural uplift a great deal of spade work has to be done by propaganda work, such as educating the villager how to live a sanitary life, improve his amenities and that sort of thing, can Government agency undertake that sort of work universally?—No, not alone; I do not think they could possibly do it; it would require a vast amount of assistance and helpers in every district and in every area.

39,423. You think, therefore, that it is the joint work of the District Officers, who must have zeal and enthusiasm for that sort of work, and also it is the work of outside helpers?—Yes, certainly.

39,424. I should like to understand the position of the District Local Boards with regard to roads. I understood you to say that they did not wish to spend money on roads. Would you explain why they are dissociated in any way from roads?—One of their responsibilities is metalled and unmetalled roads.

39,425. Why do they not desire to discharge that responsibility?—One reason is that they are unable to spend enough; whatever they could spend would not be sufficient. Moreover, they prefer to spend money on education and other activities. They are not interested in the roads.

39,426. Is it your opinion that they have unwisely preferred expenditure on education to expenditure on roads?—No, I do not say unwisely.

39,427. You do not place roads before schools?—No. I do not think you should close schools in order to improve the roads.

39,428. But do you think it would be wise not to extend schools in order to improve the roads?—No, I would not go so far as that.

39,429. There has been some deterioration in the roads, and you think that is inevitable?—To a certain extent it is, because these roads have now been thrown on to the Boards, and the Boards have not, in many cases, the proper staff for keeping them up. These roads used to be under the Public Works Department, and now they are under the District Board Engineer, who has no one over him.

39,430. That is just the point I wished you to explain to us. Has it been the policy of Government recently to transfer the upkeep of roads from the Public Works Department to District Local Boards?—Yes, in the case of what are called local roads, as distinct from provincial roads. The local roads have been handed over entirely.

39,431. These local roads were previously maintained by the Public Works Department?—Yes, but the expenditure passed through the books of the District Boards. The allotments were made by the District Boards.

39,432. When you say the upkeep has been thrown on the District Local Boards, do you suggest any additional expenditure has been thrown on them?—No, there has been no additional expenditure.

39,433. Then there is no reason why the District Local Boards should not maintain those roads in as good a condition as before, except for the inefficiency of the staff?—That is one of the main reasons.

39,434. What others are there?—That is perhaps the only reason, apart from inadequate funds.

39,435. Are the District Local Boards spending less money on the roads than was being spent before by the Public Works Department on their

behalf?—I do not think they are spending less, but the expense of upkeep has enormously increased.

39,436. Why?—Owing to the general rise in prices. The cost of metalling a mile of road now is very much greater than it was seven years ago.

39,437. In what year was this transfer made?—In 1924, I think.

39,438. Has there been any increase in the cost of the upkeep of roads since the transfer was made?—Not since 1924, but there has been since a few years before that, and the grants for roads had become insufficient even in the time of the Public Works Department.

39,439. We have had it in evidence that the resources of the Provincial Government have increased considerably since the Reforms; the total budgeted revenue of the Provincial Government is much greater now than it was before the Reforms?—I believe it is.

39,440. You cannot give me any figures?—No.

39,441. Would you accept a figure, for the increase, of 5 or 6 crores?—I cannot say; I have never compared the revenues.

39,442. You admit there has been a considerable increase in the total revenue of the Province?—I believe there has been, but I have never dealt with that subject.

39,443. Assuming that is so, is it your opinion that, speaking generally, the District Local Boards have received for road purposes a fair proportion of the increased revenue of the Provincial Government?—I could not say what proportion they receive. It is generally made in the form of special grants.

39,444. Would it come in the Civil Works Budget of the Provincial Government?—I do not know where it would come.

39,445. I have here the Civil Works Budget, which shows that expenditure on civil works was over 80 lakhs in 1924-25 and under 60 lakhs in the current year. That includes a reduction of expenditure on communications from 8 lakhs odd to 3 lakhs, and a reduction in grants-in-aid from 8½ to 6 lakhs. This would seem to suggest that the contributions from the Provincial Government to the District Local Boards and its own expenditure on roads had fallen off considerably in the last two years?—I do not think those figures would include contributions to District Boards.

39,446. What does "grants-in-aid transferred" refer to? It is under the heading of Civil Works. What can it refer to but grants-in-aid for roads?—I cannot say.

39,447. That does distinctly mean roads in other Provinces. At any rate, you do not suggest that the Provincial Government is in any way responsible for the inadequacy of the funds at the disposal of District Local Boards for the upkeep of their roads?—No.

39,448. Nor can you refute a suggestion of that kind?—No.

39,449. *Sir Ganga Ram*: Was the state of the roads any better in the days when there were official chairmen than it is now?—The District Board roads have certainly fallen off since 1924.

39,450. You think that is due not only to inadequate funds but to inefficient staff?—That is so.

39,451. Is there no one to control this staff? Is it not the duty of the Commissioner?—No, he has no authority in the matter at all.

39,452. On page 626, you give the cost of nitrates as Rs.9 per maund in Saharanpur. Are you sure of that figure?—These are figures given to me by the Collector of Saharanpur. I think they are wrong; it does not cost so much as that.

39,453. Has this tax on property to which you refer remained in abeyance in the Province, or has it been levied anywhere?—The Meerut Board are now starting it.

39,454. Can the proceeds be spent on roads?—Yes, for any purpose. It goes to the general funds of the Board.

39,455. On page 625, you say that many villages are ten miles or more distant from any recognised road. Have you no system of *mandis* where the cultivators can sell their produce?—There is no organised system.

39,456. We have in the Punjab an organised system of that kind?—There is nothing like that here.

39,457. Is there a Board of Communications here?—Yes.

39,458. Is not that part of their duty?—I do not know what their duties are.

39,459. Are there no rules laid down by Government for the guidance of District Boards as to what proportion of their revenues they must spend on roads?—No.

39,460. *Sir Henry Lawrence*: Was this Board of Communications formed recently?—It has been in existence for several years.

39,461. What are their functions?—I do not know.

39,462. They must co-ordinate the road policy of the Province, I suppose?—I imagine they do.

39,463. Do they never communicate with the Commissioner?—Yes, on individual subjects; generally on the question of whether a particular road should be provincialised or not, and things of that kind.

39,464. If a road was falling out of repair, would the Board of Communications have any power to intervene with the District Local Board?—If they have that power, it is not one that is ever exercised, nor is it one of their recognised powers. Government can call on a Board to fulfil its duties in the matter of roads.

39,465. *Mr. Calvert*: Cannot the Commissioner do that also?—He can, but he has been left with so little power that he cannot do very much.

39,466. *Sir Ganga Ram*: On page 625, you say, "The breaking of culverts owing to failure of repairs is becoming serious." Are you referring there to canal or to drainage culverts?—To those which carry the drains across the roads.

39,467. And which were originally made by the Public Works Department?—Yes. In many cases they have broken down, and no one troubles to repair them. That is on unmetalled roads, of course.

39,468. Would you support the proposal that Government should construct tube-wells and give out the water on a co-operative system? I know of one man who constructed a tube-well which was too big for his own needs, and was therefore uneconomic. Would you support the idea of Government constructing a series of tube-wells and giving the water out on the irrigation system?—It sounds an attractive idea, but I have never thought of it before.

39,469. *Sir Thomas Middleton*: Has there been any change in the relationship of officers of other departments (such as Forests, Agriculture, Education) to the Collector within your experience?—I do not think so.

39,470. The introduction of the Reforms has made no difference in that respect?—I do not think it has.

39,471. In former times the Collector was head of everything in the district and was referred to in connection with all district movements. Is it not the case that now an agricultural question may go right past

the Collector to the Director of Agriculture? The Collector may not hear of the agricultural movements in his own district?—There is that tendency.

39,472. You do not notice that markedly?—I cannot recall an instance. I have not been a Collector for the last eight years.

39,473. In your note you mention the deterioration of seed; can you remember any variety to which this criticism was applied?—Wheat.

39,474. Do you remember whether it was one of the Pusa wheats?—I cannot say what it was.

39,475. Deterioration might be due to different causes; it might be due to mixture, probably it was due to mixture?—Yes.

39,476. You advocate demonstrations in villages. Are demonstrations in villages not now numerous in the United Provinces?—I believe they are being introduced now. I do not know since when they have been started. I am told that it is the present policy.

39,477. It is a comparatively modern development?—Yes.

39,478. Similarly, you advocate supply of seed, &c., at reduced rates to people willing to experiment. Is that not now being done?—I am not aware whether it is being done or not. There is no doubt that cultivators like Jats, if they come to realise that a thing is good, will take it up.

39,479. With respect to village roads, you have indicated that the kind of body you had in view was either a village authority or a group of villages, something of the panchayat type?—Yes, something of the panchayat character.

39,480. From what source would that body derive funds?—That I have not thought out.

39,481. Do you think that it would be possible to authorise such bodies to require a certain number of free days' labour in each area for the repair of roads from the cultivators in the village?—That would be re-introducing a system which has been gradually broken, the system of compelling the village serf to work for nothing.

39,482. It is not a village serf; it is the village cultivator. I am now thinking of a country in which many improvements in the countryside were going on a century ago; there it was frequently a condition that each tenant of land should supply a certain amount of labour free, for the improvement of estate roads. The total time given was very small, but the results were that the roads were kept up?—It would want someone to control it.

39,483. There must be authority behind?—Yes.

39,484. Your panchayat or the local authority must derive the authority from legislation or otherwise?—Yes.

39,485. *Sir Ganga Ram*: Is there no Panchayat Act in this Province?—We have got the Panchayat Act; but the panchayats are formed primarily for deciding cases. They can, however, spend any funds which they have on local improvements.

39,486. *Sir Thomas Middleton*: From page 626 of your memorandum I take it that your considered view is that Government supervision is essential for the co-operative movement?—It is absolutely essential.

39,487. But I think in reply to Mr. Calvert I heard you say that it was only temporarily essential. If you get better education the necessity for the close supervision which you require would disappear?—Co-operative societies require supervision, but, strictly speaking, they should supply their own supervision; it should not come from outside.

39,488. My question refers to the outside supervision. Temporarily, it is essential and must be supplied by the Government?—Yes.

39,489. Have you considered at all what time it will take for the co-operative movement to run itself?—I am afraid I have not.

39,490. Considering the position in the United Provinces, the time might be infinite?—I am afraid so.

39,491. You mention the failure of one cattle-breeding society which was formed in the United Provinces. Can you remember now whether any reasons were given to you for its failure?—I cannot remember.

39,492. *The Chairman*: Do you think that there is a sufficient amount of credit available to the cultivator in the United Provinces to-day?—It is a very difficult question for me to answer off-hand.

39,493. It is also a very difficult one for us to answer. Do you think that the provision of further credit at a lower rate of interest than that at present paid by the cultivator and in the cultivator's present state of knowledge would be of service to the agriculturist?—Not unlimited, because if you dangle money in front of the cultivator he will always take it whether he wants it or whether he does not want it. I mean there are dangers to the cultivator himself in giving cheap credit.

39,494. The measure of his avidity for borrowing is the extent of his credit, the capacity to borrow?—He is very improvident.

39,495. So that we come back to the principal theme of your Committee's Report, namely, that education is the first function of the co-operative movement, and until the cultivator is educated to the better using of money it is very little use placing more credit at his disposal. Will that be a fair statement of your views?—His present credit is undoubtedly very expensive. The rates he pays for his credit are extremely high. I do not think the co-operative rates are very high.

39,496. If you are going to bring down those rates by a substantial amount, would it, in your view, be essential that either a closer scrutiny of the application for credit should be made or else the education of the cultivator should first be undertaken?—Either there should be a closer scrutiny or he should have a better understanding.

39,497. Which would you yourself like to see come first, provision of cheaper credit or an attempt to organise and educate the cultivator through the co-operative credit movement?—I think they should go side by side.

39,498. Assuming that further and cheaper credit were made available through the co-operative movement?—Yes.

39,499. But any attempt to supplement the co-operative credit movement or some other movement, whether conducted by Government or howsoever, which will not in itself be educative, might rather retard than encourage the growth of the true co-operative movement?—You mean the conflict between the *taccavi* and other forms of credit?

39,500. Yes. *Taccavi* is an instance of the sort of facilities of which I am thinking?—I do not think *taccavi* has any retarding effect on the co-operative movement.

39,501. What is the rate of interest on *taccavi* in the United Provinces at the moment?—I think it is 7½ per cent.

39,502. Let us assume that the interest for *taccavi* loans is reduced to 6 per cent., and that instructions were issued to the effect that *taccavi* loans should be made more general and easily available to the cultivator; let us assume that instructions were issued to the effect that the recovery of the principal of the cultivator's loan was to be eased from the cultivator's point of view; what effect do you think that would have on the co-operative movement in the United Provinces, on the credit societies?—I do not think it would have any particularly bad effect at present.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Saturday, the* 19*th February,* 1927.

Saturday, February 19th 1927.

DELHI.

PRESENT:

The MARQUESS OF LINLITHGOW, D.L. (*Chairman*).

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S.
Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S
Professor N. GANGULEE.
Dr. L. K. HYDER.
Mr. B. S. KAMAT.

Raja Sir RAMPAL SINGH—(*Co-opted Member*).

Mr. J. A. MADAN, I.C.S., Mr. F. W. H. SMITH, } (*Joint Secretaries*).

The Honourable LALA SUKHBIR SINHA, the United Provinces Zamindars Association, Muzaffarnagar.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(*a*) (i) Every Provincial Government ought to have one or two experimenting stations like Pusa and Muktesar where research on scientific lines may be carried on, both into the modern theory in order to find out how far it can be economically and conveniently adapted to Indian conditions and also into the indigenous theory for ascertaining what improvements can be effected therein and for finding out the economic value of traditional methods of agriculture. Just as the success of a central department depends upon the support given to it by similar departments, so it is an established fact that the utility and success of provincial departments is vouchsafed by a strong and efficient central head through which the provincial activities may be co-ordinated and may be saved from dissipation, because, though every Provincial Government has problems peculiar to its own conditions, yet there will be a lot of overlapping if there is not a suitable central agency to guide them. The institutions maintained may confine attention to broad matters which affect several Provinces together and may carry on the work of specialisation.

In course of time when the finances improve and more public support is forthcoming, the Association shall recommend that experiments may also be carried on in district agricultural schools and farms, as there are several agricultural practices and insect pests which are peculiar to a certain area. The Central Provincial Research Institute will specialise and guide the activities of district institutions.

(ii) Veterinary Research has so far received very scant attention and animal diseases are becoming so varied and numerous that the veterinary surgeons do not even understand their nature and names and so find themselves unable to diagnose them. Thousands of animals fall victims to such diseases and this hits hard on the poor cultivator who is forced to borrow money. Every Province should provide at least one big veterinary research station where research into indigenous herbs and drugs may also be carried on side by side with research into animal diseases, as there are several indigenous herbs which are very potent in curing animal diseases and which may be very cheap, being obtainable in large

quantities and so within means of the poor cultivators. The Association is also of opinion that classes may also be held at such research stations for turning out qualified veterinary surgeons who may be educated and trained more in the Indian system of treating animals than in the Western system. These institutions should also be managed under the Agricultural Department.

As for finances, the Association is of opinion that a larger percentage of the general revenue should be utilised for the improvement of agriculture as land tax provides an increase of about 50 crores, out of which only 82 lakhs is spent on agriculture by the Provinces and the Central Government and thus the proportion of expenditure on agriculture is less than 2 per cent. The Provincial Governments should not grudge this as, during the last two years, they have been having surpluses and provincial contributions have been considerably reduced and might be remitted in the near future. The District Boards should also co-operate more with the Government in meeting expenses on agriculture. If there be further need, a small export duty may be levied on exports of raw materials and the import duties may also be increased on sugar, cotton goods and silk, etc.

(c) (1) Entomological and pathological research in connection with plant diseases and pests should be thoroughly studied and research made into the practical methods of eradication; for example, red-rot, sugarcane fungus diseases (rice hopper, white ants, etc.).

(2) There is lack of activity in the direction of arboriculture, plant breeding and the fruit industry. A variety of fruits and timber can be grown in several districts and will provide spare-time employment for agriculturists if there is proper direction with regard to the soil and climatic conditions of each place, and as to the varieties of fruits and timber which it may be commercially profitable to produce.

(3) Lac and silk.—There are a lot of trees in several districts which can breed these worms. So attention should be directed to these.

(4) Research into the theory of dry cultivation.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) and (ii) The supply of institutions and teachers is neither sufficient nor efficient. So far as the Association knows, in all agriculturally advanced countries, e.g., in America, every State maintains an agricultural college and research institute with a farm, besides the institutions maintained exclusively by the Central Government. But in India, the United Provinces of Agra and Oudh, for instance, possess only one agricultural college at Cawnpore and one district school at Bulandshahr, which are insufficient to meet the requirements of a Province with more than four crores of population. The Association is of opinion that at least one agricultural school should be established in every district. If the Government, for want of finances or any other cause, is unable to start separate agricultural schools and colleges, I am prepared to go to the extent that the Government schools and colleges imparting liberal education should be reserved for imparting agricultural and industrial education, as private enterprise has already begun to play an important part in the sphere of liberal education and as there is a sufficient number of aided schools and colleges.

(iii) The teachers in rural areas may be drawn from the agricultural classes as this may serve as an incentive for education among the agricultural classes and as they will be more useful, having first-hand knowledge of rural conditions.

(iv) The attendance, considering the small number of agricultural institutions and the distance that separates them from people of several areas, and the theoretical nature of education imparted in them, may be considered reasonable. But I think if agricultural institutions are established in other important centres and education made more practical and the course is not lengthy, the number of students will greatly increase.

(v) As interest in agriculture is not thoroughly developed and as few people think of cultivating on modern lines and as facilities for acquiring land and capital do not sufficiently exist, the main incentive in attracting lads to study agriculture is the hope of getting employment in Government service or elsewhere.

(vi) No, they are drawn from all classes and are not confined to the agricultural classes alone.

(vii) The courses of study require modification, and they should be altered to fit in more closely with Indian practice than with Western theory; education should be imparted through the medium of the vernacular.

(viii) All the items (*a*), (*b*), and (*c*) are very necessary according to the standard of education, i.e., in the lower primary schools, nature study should be made compulsory and, in upper primary schools, there should be school plots, while in the town and high schools there should be farms. By so establishing plots and farms, students will be attracted in a large number to these institutions, where several practical things will be taught which may be of general use in every day cultivation. The cultivators will also begin to have more confidence in the possibility of educating their children.

(ix) The majority of students find no work to do. They first hanker after Government service and when they fail they sit idle at home, as very few have sufficient facilities to start private farms.

(x) After agricultural education has been given to them, they should be given facilities for getting consolidated holdings, obtaining capital on low rates of interest and on long terms of credit and, if the holding is situated in a locality where water facilities are not available, wells should also be erected and a reasonable water rate should be charged. Marketing facilities and means of communication should also be improved. Facilities should also be given to lads in getting appointments in the Agricultural Department, Court of Wards, Irrigation Department and Districts Boards. All possible help and facilities should be given to students in securing sufficient land for their own cultivation and opening farms on modern lines. A grant-in-aid should be given to deserving candidates who start their farms on modern lines. All this can be done by the co-operation of Government officers, the landlords and the bankers.

(xi) No, there should be facilities for the provision of agricultural literature in the public libraries and to the teachers of the rural area schools. Students who have studied agriculture should be invited by the Superintendents of agricultural farms to a yearly or biennial conference where they may be able to discuss questions that affect them, in the light of the most up-to-date research and may also be able to study the different field operations.

(xii) Lectures should be given with the help of magic lanterns and cinemas and practical demonstration on agricultural farms. Agricultural exhibitions should be arranged and prizes and rewards be given to competitors in almost every district. Scholarships should also be given at the outset to deserving and needy students.

(xiii) (*a*) In every school, where there is a school plot or school farm, there should be trained men to supervise the work and teach the students under the direct control of the village panchayats or a body appointed by the District Boards. This work should further be supervised by an Inspector of the Agricultural Department.

(*b*) Finances we have already discussed in our reply to Question No. 1. We suggest, further, that the import duties on sugar, silk and similar other agricultural articles be used for the improvement of these industries in particular and agriculture in general as they are levied not so much for the sake of revenue as for the protection of these industries.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The following measures have been found successful and may profitably be adopted in India for propaganda:—

(1) Demonstration farms.

(2) Experiments with seeds and implements on the plots of cultivators.

(3) Lectures on improved seeds and implements.

(4) Circulation of agricultural pamphlets and publication of agricultural magazines.

(5) Agricultural exhibitions.

(6) Agricultural Associations, Zamindars and Tenants Associations and Conferences.

(7) Societies for the supply of seeds and implements.

(8) Cinema films and magic lantern lectures.

(9) Periodical touring of professors with groups of students who may mix with village people and lecture to them on agriculture.

(10) Broad-casting.

(11) News bulletins should be posted at village post offices.

(12) Propaganda amongst railway passengers, who are mainly drawn from agricultural classes.

(13) New seeds and implements should be demonstrated and exposed to public view on market days, *melas* and fairs where cultivators from surrounding tracts gather.

(*b*) In different localities by turns, big tenants should be induced, even by financial help if necessary, to set apart a certain parcel of land for experimental purposes to test methods especially adapted to their particular locality. The Government should send experts there to analyse the soil, discover just what chemical constituents are lacking in it and what fertilisers are necessary to bring it up to productive perfection and for what particular crops it is best suited. It is an everyday experience that cultivators, conservative and poor as they are, do not feel inclined to adopt methods and seeds unless they see their success on their own land. Such experiments will create confidence in the minds of the cultivators of the locality.

Besides the above method we also recommend that, at demonstration farms, conferences should be held to which cultivators of different tracts may, by turn, be invited. At such meetings lectures should be delivered and practical demonstrations and exhibitions of private products held.

(*c*) Yes, besides the methods described in (*a*) and (*b*) above which in themselves induce the cultivators to seek expert advice, cultivators may be encouraged through the members of the different agricultural and other associations to attend the associations' meetings, where agricultural experts should be present to advise them. Also cultivators may be encouraged to adopt the practice of securing expert advice, by sending questions to Government experts, to which the experts should promptly and fully reply and, if need be, go themselves to the locality to explain. Furthermore much depends on the confidence which the Government officers are able to create in the cultivators' mind by mixing and sympathising with them.

QUESTION 4.—ADMINSTRATION.—(*a*) Since the Reforms and the appointment of Ministers, the local Governments are, no doubt, spending more money now than before on agriculture and more attention is given to it, but, in our opinion, the Government of India should also maintain a separate Department of Agriculture of its own and thus save dissipation and overlapping and waste of energy by co-ordinating and supplementing the activities of the Provincial Governments and by taking charge of subjects of All-Indian importance, so far as they have a bearing on agriculture, such as Posts and Telegraphs, Railways and Roads, the Meteorological Department, Finance, and also research into crops of national importance like cotton, wheat, sugar cane and tobacco. The Government of India, in our

opinion, should appoint an All-India Board of Agriculture. The success of the Indian Central Cotton Committee has shown that such an institution is indispensable for the success of other important crops like wheat, sugar cane and tobacco and agriculture as a whole. Such a Board shall arrange for thorough research into these crops on the general lines followed by the Central Cotton Committee, hold conferences in the Provinces and advise the Government of India on all matters affecting Indian agriculture.

(*b*) There is no need of pooling the services of experts under the Government of India, but the Central Government should as at present, maintain its own research institute, which should specialise in particular subjects and leave the rest to the Provinces.

(*c*) (i) The Agricultural and Veterinary Services are top-heavy. The high officers pay only flying visits and seldom come in contact with the cultivators and hence are unable to give much practical help to the agricultural classes. There is need of a large number of subordinate officers in districts, who may tour and mix freely among the cultivated classes and try to create confidence in the villagers' minds.

(ii) Railways and steamers are doing great services to the agriculturists but their activities require expansion in several directions. There ought to be more feeder railway lines which may extend into the interior and thus improve village communications. Freights on manure and implements and agricultural products should be reduced and third-class railway fares should be lowered, in order to encourage travelling amongst the cultivators and thus broaden their outlook by mutual intercourse and visits to exhibitions, etc. Coastal steam navigation should further be developed. Traffic by means of steamboats should be increased on large rivers and canals like the Ganges, the Indus, the Brahmaputra, the Ganges Canal, and so on, as it will afford a cheap and efficient means of communication with the interior and thus render unbounded services to agriculture.

(iii) Roads are in a very deplorable condition in the *mofusal*. There are districts in which even tashils are not connected with the headquarters by metalled roads. There are hardly any village *pucca* roads and whatever *katcha* roads or village tracts there are, they are in a very bad state. We have seen instances where, during the rainy season, villages become unapproachable for months together. This lack of roads obliges the cultivator to sell his produce locally as he cannot take it to the market place where he may be able to sell at a greater advantage. Lack of means of communication prevents the development of markets in the rural tracts and make it difficult for the agriculturists to get prompt medical and veterinary aid and expert advice on crops and implements, etc. Roads should be metalled as far as possible and *katcha* roads should be kept in better condition. The District Boards and the Public Works Department should co-operate more thoroughly and should be more active in this direction.

We brought this matter to the notice of the United Provinces Government by means of resolutions in the months of September and December, 1910, but nothing was done.

(iv) The meteorological observations and forecasts should be translated into the vernaculars of the Province and distributed free in villages, at least the *patwaris* and the school teachers should get copies, and they may be directed to send and explain them to the cultivators so that they may be able to guard themselves against impending calamities of drought, hail or storm.

(v) and (vi) The aim should be to provide every village with a post office and every *kasba* with a telegraph or telephone office, so that information of prevailing market rates, and latest agricultural improvements and discoveries may reach the rural centres at the earliest opportunity. The development of post, telegraph and telephone will greatly increase the selling power of the cultivators.

The Honourable Lala Sukhbir Sinha.

QUESTION 5.—FINANCE.—(*a*) (1) Expansion of the Co-operative Department by opening more co-operative banks, credit societies, sale and purchase societies, implement societies, irrigation societies, and so on, which should be able to finance agricultural operations and provide credit to the cultivators.

(2) Establishment of land mortgage banks which should provide long-term credit on easy terms. The Government should also give aid in the form of loans to such banks on low rates of interest. Such banks, besides enabling the cultivators to wipe off their debts will increase their reserve power. They will sell their crops at the proper time. The Imperial Bank with so much Government money at its disposal without interest should co-operate with and help these banks to a greater extent.

(3) Recurring and non-recurring grants should be given by the Government to students of agricultural colleges and schools who start farms on modern lines and control should be kept over such farms in the same way as in aided schools and colleges.

(4) The Government should appoint a small Board of, say, three or four members, presided over by the Director of Agriculture which may advise the Government in the granting of loans and grants-in-aid. The Board should be run on the same lines as the Board of Loan Commissioners in the Industries Department of the United Provinces Government.

(*b*) *Taccavi* should not be distributed through the Revenue Department, except in famine tracts and other special areas, as the cultivators use most of it in unproductive purposes and some of it is misappropriated before it reaches the applicant. The *taccavi* should be given through the co-operative societies so that the cultivators may not use it for unproductive purposes and may be able to repay it.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) Natural calamities, such as failure of the monsoon, irregular rainfall, hail-storms, frost, outbreak of cattle diseases, purchase of occupancy rights, and unnecessary litigation; bad social customs and rules requiring the cultivator to incur a lot of unproductive expenditure on marriages, death ceremonies, house building, feasts, etc.

(ii) The chief source of credit to the cultivator is the village *shroff* who is always ready to give credit to the cultivator at a high rate without caring to what use the cultivator puts the borrowed money.

The co-operative credit societies are still in their infancy but they are doing very useful work in this direction.

(iii) The low margin between the cost of production and the sale price. The usurious rate of interest which often rises very high, lavish expenditure over unproductive purposes.

(*b*) and (*c*) (1) Spread of education in order to broaden his outlook, create a sense of self respect and raise the standard of living.

(2) The spread of co-operative societies.

(3) Land mortgage banks, which should enable the cultivator to wipe off his debts at easy rates of interest on long-term credit.

(4) Measures should be taken to restrict the credit of cultivators. Non-terminable mortgages render the cultivator landless and should therefore be prohibited. In the United Provinces of Agra and Oudh, the Agra Tenancy Act III of 1926 has somewhat restricted the cultivator's power to mortgage his cultivating rights under Section 27, and it might produce wholesome effects.

(5) The Government should help cultivators financially in the reclamation, protection or improvement of land, recovering it in the form of enhanced assessment.

(6) The development of side industries such as cattle breeding, spinning and weaving, horse breeding and poultry raising, thus reducing pressure of population on land.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—The Association is strongly in favour of consolidation of holdings, but this cannot be done without overhauling the present Land Revenue and Tenancy Acts. In Japan and other countries, consolidation of holdings and prohibition of sub-division of holdings has proved very useful. The United Provinces Government, on the suggestion of Mr. W. H. Moreland, Director of Agriculture, invited public opinion on this subject, but we do not know why this matter was dropped; perhaps it was because the difficulties on account of land legislation were found unsurmountable.

Sub-division is often the outcome of inheritance and succession. Several big states are being divided into the several claimants converting them into petty landlords. We are strongly of opinion that some sort of legislation should be devised by means of which partition of states may be prohibited, the profits being only divisible. This will prevent sub-division.

As regards fragmentation of holdings, we think a minimum limit might be fixed by legislation beyond which fragmentation will not be allowed and the Settlement Officer should be given some powers to consolidate holdings at the times of settlement as that is the best time for settling such matters.

Consolidation of holdings may also be attempted through co-operative societies as is being done in the Punjab and also through village panchayats, by convincing the landlords and the cultivators of the importance and utility of consolidation.

QUESTION 8.—IRRIGATION.—(*a*) (i) In the United Provinces, there is hardly any big river left from which any canal can be cut, but there are many small rivers that can be dammed for irrigation purposes.

(ii) Yes, tanks and ponds should be made wherever possible and should be filled with rain water that is now wasted in large quantities.

(iii) Yes, there is great scope for extension of irrigation from wells; where there already is irrigation from wells or it can be had, no canal water should be allowed there. When the Deoband branch on the Ganges canal was opened, it was made a condition that no canal water would be supplied to those lands that were irrigated from wells, but this condition was gradually overlooked, on account of which hundreds of wells have gone out of use. I moved resolutions on the question of well irrigation and preservation and storage of rain water in the United Provinces Legislative Council in 1916, from the debates of which my proposals can be seen. The Association would suggest the creation of a Tanks and Wells Department of Irrigation, similar to that existing for canals, so that this sort of irrigation may be extended either by Government or by landlords or by co-operative societies, and water rates for such irrigation may be collected through the Revenue Department like the canal water rates. In our opinion, this arrangement will prove very useful and profitable, and details may be worked out.

(*b*) The existing methods of distributing canal water to cultivators is not satisfactory as water is not supplied at the time when it is required and the quantity is not sufficient. The dimensions of the outlets have been reduced from time to time and the beds of channels have been lowered so that enough water may not pass through them. This has been done not so much to stop the wastage of water as to save water to irrigate new lands. This is evident from the fact that the supply of water in canals is the same in quantity, while new lands have been irrigated from the same supply. My father, the late Honourable Rai Nihalchand Bahadur compiled and published a pamphlet on this subject, from which it will appear that 1,130 miles of new channels were opened during five years (1900-04) and these were fed from the old channels to irrigate new lands. The figures after this period, which I could not obtain, will, I believe, show a further extension of new channels. There is no doubt that there was some wastage of water that was necessary to be checked by diminishing the diameter of outlets and by deepening the beds of channels and by the new system of

tatil, but the crops have suffered a good deal, especially the sugarcane crop, for which sufficient water is not supplied. In the United Provinces a joint sub-committee consisting of two members of the Board of Irrigation and three members of the Board of Agriculture was appointed in the year 1921 to make enquiry and report as to how sufficient water could be supplied to sugarcane, but to no effect. The Association would strongly urge that the present canal water should not be supplied to new lands until and unless it is proved that water can be spared for them without prejudicing the supply to old lands.

The Association is aware that the irrigation charges are not within the terms of reference of the Commission, but every Famine Commission has dealt with the question, and, therefore, without saying a word about the rates, the Association would strongly recommend that no profit should be made from irrigation charges for general expenses by the Government, as irrigation conduces towards the indirect revenue of the Government by promoting (1) prevention of famines, (2) general improvements in the financial condition of the people by having more produce from land, (3) stability of land revenue and full collections, without any remission, and (4) increase of land revenue in every revision of settlement.

QUESTION 9.—SOILS.—(*a*) (i) Yes, water-logged soils, especially by the side of railways and canals, should be improved by means of drainage.

(ii) Alkali (*usar*) and uncultivable land may be improved by drainage and by plantation of certain trees which may be specially suited for such land, such as *babul, dhak* and *chhonkra* (*jand*).

(iii) Prevention of erosion of the surface soil by flood water or rain water may be done by making embankments at suitable places.

(*c*) Such lands should be acquired by Government from the proprietors or the proprietors should be induced to make *chaks* of such land, say, of about 100 acres, and these should either be auctioned to those who want to cultivate themselves or should be given to qualified students from agricultural colleges and schools on moderate terms, so that for the first four or five years they may not have to pay anything as rent, and when they get some profit, a nominal rent, say, about Re.1 per acre may be fixed. Then, each year, the rent per acre may be increased by about 2 annas, and thus, after 25 years, a rent of about Rs.3-8-0 per acre may be permanently fixed and right of occupancy given to them. Besides, the Government should give pecuniary help to such enterprises for the erection of buildings, purchase of cattle, implements, and seeds, &c., which should be realised from them by easy instalments. If such places are unhealthy, drainage should be improved and wells erected.

QUESTION 10.—FERTILISERS.—(*a*) Natural manures are more profitable as they cost less and contain nearly all the ingredients required for the healthy growth of the plant, while artificial manures cost much and have only one or two ingredients, and if applied in excess (as is expected to be done by the ignorant cultivators) may do much harm instead of good; even if applied in moderate quantity by an expert continuously for several years, a time will come when it will not give any result, as the soil will be lacking for want of other ingredients required for the healthy growth of the plants. But to make up the deficiency of the natural manure, which is so common in many places, artificial manures can also be profitably used. Propaganda is needed for the use of manure spreaders, scientific methods of storage, the better utilisation of liquid manure and the growing of leguminous crops.

(*b*) The artificial manure should first be analysed by the Agricultural Chemist and a certificate given to the owner of the fertiliser to the effect that such and such fertilisers contain so much percentage of nitrogen, phosphate, sulphur and sodium, &c.; after getting the certificate, the owner should fill up bags and have them securely packed and sealed, say, about

one maund in each bag, and sell it to cultivators through agencies or other merchants, declaring that it contains such and such a percentage of such and such a thing. If officers of the Agricultural Department suspect adulteration, they should get a sample from the shop of any such merchant and get it analysed. If the ingredients are contrary to the declaration, Government should take steps under the prescribed law.

(*c*) The improved artificial manures can be popularised either through the propagandists of the Agricultural Department, canal officers, officers of co-operative societies and zamindars' associations, or by the propagandists of the firms, as in the case of Messrs. Shaw, Wallace & Co., Calcutta. The best propaganda is to apply such manure once or twice, free of charge, on some fields of the cultivators and thus give them practical proof of its utility.

(*d*) Muzaffarnagar, Saharanpur, Dehra Dun, Meerut and Bulandshahr.

(*e*) Investigation into the possibility of manufacturing bone dust on a large scale should be made.

(*f*) (1) The practice of using cowdung as fuel could be discouraged by explaining to cultivators the loss they sustain by using cowdung as fuel instead of manure, and convincing them of the advantage they will achieve by methodical storing and application as manure. To replace cowdung as fuel, the Government should encourage afforestation among the landed proprietors and by the Forest Department, which will give them the fuel required and will also serve the purpose of grazing grounds.

(2) The railway authorities should decrease their railway freight on fuel wood carried to a distance of over 100 miles from forests, and Government should supply fuel on cheap rates from their forests.

(3) The District Boards and canal authorities should be asked to sell the roadside trees and their loppings to cultivators at cheap rates. These loppings will serve two purposes, one as fuel and the second will remove the shade from trees falling on the adjoining lands, and thus make more productive lands which are now becoming useless and unproductive.

(4) The Association would also suggest the introduction of a better, but cheap, system of storage of manure in villages. At present, there is no such arrangement, and the fertilising power of the manure is wasted and decayed.

QUESTION 11.—CROPS.—(*a*) (i) There is a great scope for improvement in the existing crops; they could be improved by selection of seeds and crossing, by tillage with improved ploughs and other implements, and by a sufficient supply of water and manure. At present, cultivators give their whole attention to the growing of sugarcane and wheat on old lines in these districts, as they are considered to be the chief crops and the most profitable, but they generally use the ordinary seeds and do not try the improved ones, e.g., Pusa 12 wheat, and some other varieties of sugarcane, such as Cuba, which have been introduced by the Agricultural Department, but to a very small extent. I think the supply of improved seeds from the Government demonstration farms at a cheap rate will give an impetus to the poor and conservative class of tenants, as they are very much afraid of any loss in making experiments.

(iii) Improved seeds, which have been found to be useful by experiment, should be largely introduced; this can be done by issuing good and pure seeds from Government farms to seed-supply societies and private farms in the districts, and such farms are expected to increase in number. These private farms should store all their produce for seed and distribute to the public at market rates. To keep up the purity, the private farms should purchase their seeds from Government farms each year, where special care for producing pure seed is taken. The private farms should also be inspected by the officers of the Agricultural Department. If such farmers are not in a position to store their seeds on account of financial

stringency, their seeds should either be purchased by the co-operative seed-supplying societies, or the co-operative societies should give them the money required to help them, taking their seed as security. On these private farms and at other suitable places, seed godowns should be erected by the farmers and zamindars with Government aid.

(iv) (*a*) Where such preventions are needed, licences to cultivators for killing or frightening off wild animals should be issued, free of charge.

(*b*) Government should give grants for fencing on easy terms.

QUESTION 12. — CULTIVATION. — (1) The existing system of tillage is defective, as the tillage is not deep enough for want of good bullocks in sufficient numbers. The great question of preserving cattle, specially cows, that are killed for food in their prime before they produce even one calf, should be tackled by the Commission.

(2) I think the cultivators are fully aware of the necessity for the rotation of crops. I may quote here Dr. J. A. Voelcker's opinion on this subject, expressed on page 11 of chapter ii of his *Report* (Second Edition, 1897) on *Improvement of Indian Agriculture*. He says: "Nor need our British farmers be surprised at what I say, for it must be remembered that the natives of India were cultivators of wheat centuries before we in England were. It is wonderful, too, how much is known of rotation, the system of 'mixed crop' and of fallowing. Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance, and fertility of resource, than I have seen at many of the halting places in my tour."

QUESTION 14.—IMPLEMENTS.—(*a*) Yes, there is much scope for the improvement of the existing, and the introduction of new, agricultural implements and machinery.

(*b*) For them more money is required, and ways and means should be devised to provide the cultivators with agricultural implements at a cheap rate. I would suggest that the hire system may be encouraged by private firms and Government agencies. Up to this time very few implements have been found useful; for instance, I have tried several kinds of ploughs, but they have all failed for want of good, strong bullocks and expert labour. Water lifts are badly wanted. Sugarcane mills, driven by bullocks as well as by power, are required. I took one sugarcane crushing machine from the Agricultural Department, but it did not work properly and I had to return it. Similarly sugar-refining machines are required. I had once a centrifugal machine from the Agricultural Department, but it also failed. This shows that up to this time very few new agricultural implements have been found useful.

(*c*) Many of the agricultural implements are patented, and few firms have the right to manufacture them. If some Indian firm tries to take a new invention and brings it to the notice of the Agricultural Department, their efforts are not generally appreciated and encouraged or patronised, with the result that the enterprisers become disheartened and never make any further effort. To overcome these difficulties, the patent implements which are in general use should not remain patent, so that every firm may manufacture them and give them at cheaper rates in competition. Circulars and orders should be issued by Government that every year there will be competitions for new inventions by Indian firms, and those found successful should be patronised and rewarded, and demonstrated on modern farms in order to create a demand. Firms manufacturing implements in India should receive bounties from the Government in order to meet foreign competition and to enable them to produce on a large scale, and the railway companies should prescribe cheap freights for agricultural implements of Indian make.

QUESTION 15.—VETERINARY.—(*a*) Yes, I think the Civil Veterinary Department should be placed under the supervision of the Director of Agriculture as agriculture is closely allied to veterinary, so that cattle may be properly looked after.

(*b*) (i) Yes, they are working well.

(ii) No, the District Boards do not devote sufficient money and attention.

(iii) No; the District Boards themselves should be required to devote more money and attention. The District Boards can do this work more efficiently and effectively, being able to understand the people and their conditions more thoroughly.

(*c*) (i) The agriculturist does not make full use of such dispensaries, as Indian medicines are not freely used and as the foreign medicines are very expensive. The cultivators are afraid of using foreign medicines for their cattle, as they do not know of their efficacy or advantages. In my opinion, simpler indigenous methods should be adopted so that people may have confidence and utilise them.

(ii) No, as the dispensaries are very few in number. The stay of such dispensaries is very short at one place and the cultivators hardly come in contact with them. They are in a hurry to complete their tours and they do not pay sufficient attention and they advise methods of treatment beyond the reach of common cultivators.

(*e*) I have been to the Muktesar Institute and I think no extension is required and the produce of serum is sufficient for Indian needs, provided that the export of serum to other countries is stopped. I brought this matter to the notice of the Council of State on the 14h February, 1921. The reference will be found in the Council proceedings, from which it will appear that out of a total of 29,49,000 doses issued, 25,000 were sent to Ceylon, the Malaya State, the Straits Settlements and Egypt, while 90,000 doses were sent for army requirements to Mesopotamia, Persia and China.

(*g*) It is one of the crying needs of the cultivators as thousands of cattle die of unknown diseases, which loss tells very heavily on them. I think, therefore, that further facilities for research into animal disease should be provided.

(i) and (ii) Whatever extensions are considered necessary may be made in the Muktesar Institute, but I am strongly of opinion that every Province should have a veterinary research institution of its own and should maintain it on a good standard. The Muktesar Institute produces sufficient serum and therefore it should not be necessary for provincial institutions to undertake this work.

(*h*) (i) and (ii) As regards special investigations, there ought to be co-ordination of effort between the officers of the Muktesar Institute and the provincial officers but such investigation ought, in my opinion, to be confined to officers of the Muktesar Institute.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) Yes, it is one of the most important factors for the improvement of agriculture and milk supply in this country. At present, there is no law for the preservation of cattle, while common game animals and birds are preserved by legislation. Prime cows and young calves are killed every day for food without any discrimination.

In the Military Department alone, lakhs of cows in their prime of life are killed. It is said that on religious grounds Mahommedans cannot be stopped from killing cows, but it is not the case, as it is only once in the year that they sacrifice cows on religious grounds, and then only in a very small number. Leaving this religious sacrifice question untouched, cows and calves that are killed in millions every year for food should be preserved to a certain age, say nine years. With such a drain, how can cattle be improved in breed and number? If some legislation like that passed by the Central Provinces Government that "no cows should be killed for food before nine years of age," is passed, much improvement in cattle is bound

to follow. At present bulls for covering cows, in villages, are not of good quality. The United Provinces Government is running two bull-rearing studs, one at Madhurikund and the other at Kherigarh. They supply bulls to local bodies and zamindars but the number is not sufficient and the price and terms are unsatisfactory. The number of such studs, where experiments in cross breeding may be carried on and a sufficient supply of bulls and cows assured, must be multiplied. Among the Hindus, the system of dedication of bulls and cows is not so useful now as it was before. A Bill on this subject was framed and introduced in the Legislative Council in these Provinces in 1916 or 1917, but was withdrawn without any discussion thereon.

(ii) and (iii) Young and milch cattle should be saved under legislation from slaughter. Importing of milk or milk products from other countries should be checked by legislation. Model dairy farms should be started and agriculturists should be induced to resort to this industry as a spare-time work. Cattle shows should be arranged on the occasion of big fairs and prizes awarded on a large scale to owners of good cattle. Propaganda should be carried on amongst the cultivators to improve the feeding of cattle, to provide better stables and to encourage better attention generally.

(*b*) (i) Common pastures are not available in villages for grazing cattle, as there is great competition for cultivable and culturable land. On account of the periodical increase in land revenue, the landlords have to bring every possible yard under cultivation and increase their rates. This question has been brought by me to the notice of the Government on several occasions, but no action has been taken. The Cattle Breeding Committee, of which I am also a member, made some recommendations to the Government but nothing has yet been done. In my opinion, a certain percentage should be fixed for every village, or circle of villages, for the preservation of land for grazing purposes.

(iii) Sufficient area for fodder purposes is not kept as the cultivators like to grow more profitable crops than fodder. Unfavourable seasons caused by late rains, early stoppage of monsoon, excessive rains, are also causes of shortage of fodder. The cultivators, being in need of money, sell dry fodder in the bazaar and starve their own livestock. The poor cultivator cannot help doing it as his reserve power is very limited.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) The cultivators are busy on their holdings during the year but they can do much industrial work in the slack season if they are made to take an interest in it and if they are made to understand the advantages of carrying on part-time industries. At present, the chief cultivators are always busy on their holdings while the labourers, when they get no work in the field, do some petty works which they know by their profession, such as basket and rope making and weaving.

(*b*) to (*h*) It is a very big question to solve as it involves the vexed question of import and export duties, on which the prices so much depend. All the industries, as mentioned in sub-clause (*c*), can be developed and the great industry of weaving has a great field. But all these village industries are dying out and are almost dead on account of competition with imported articles that are very cheap and with which hand-made articles cannot compete. In these days of competition such industries should be organised by Government help into joint stock companies, so that the workers may get enough money and a market for their manufactured articles. Industrial work, as is done at present, cannot pay the workers as much as they can get through joint stock companies.

I am certainly of opinion that Government should do more to establish industries as mentioned in sub-clause (*d*), but here also the question of money and co-operation comes in. In industrial countries like Germany and America in the West, and Japan in the East, agriculture and industries have made much progress, with State help and the co-operation of the

people. Here, up to this time, very little State help has been given to them. I may give only one example, that of sugar making. The Government of India appointed the Indian Sugar Committee in October, 1919, under their resolution No. 949/151, dated the 2nd October, 1919 (Revenue and Agricultural Department) that: "While, therefore, India, should be in a position, as she was in the past, to produce a surplus of sugar for export, she has in fact had to supplement her own supplies by imports the tendency of which steadily to increase has only been checked by war conditions." From this it is clear that the scope of development here is so great that this country can produce sugar enough not only for its own requirements but also a surplus. It is a question what the Government of India did on the Report of that Committee. There are many such industries where nothing has been done. This country has all natural facilities and was once the chief industrial country in the world, but on account of the frequent changes of Government and lack of education and means of communication, it has lagged behind other countries that are now richer than India. It is evident from the fact that almost all raw materials, like cotton, jute, hessian and leather, and even drugs and medicines, are exported in their raw condition and imported after being manufactured at as much as twenty times the price. What more, or better, suggestions and proposals can be made than those made by the Royal Industrial Commission in their Report of 1916-18.

QUESTION 19.—FORESTS.—(*a*) The forest lands are not at present put to their fullest use for agricultural purposes. Grazing facilities granted to villagers are not sufficient. The number of cattle fixed in each village is insufficient. On this subject some resolutions have been moved by me and other members, and discussed in the United Provinces Legislative Council in which many points were raised. The present Forest Rules require a good deal of change to give full advantage, in forest lands, to the villagers for providing grazing facilities for their cattle, and grass on reasonable cheap rates.

(*b*) Yes, the supply of fuel and fodder from forests in rural areas may be increased by making the Forest Rules easier than they are at present. Arrangments for producing fodder crops instead of grass, in such areas where possible, should be made and the forest tax on fuel carts charged at the forest *chaukis* should be reduced. The railway authorities should give concessions for transporting fodder and fuel from such areas to the consumers.

(*c*) Yes, there is a great opening for schemes of afforestation, in villages, by landowners and the Government. If expert advice is made available to them and some system of supervision is provided to look after such private forests, I am sure many landlords will come forward to plant trees on their lands. For this purpose I would suggest that, as an experiment in a Division, for instance in Meerut Division, a staff of experts be appointed to help and advise the landlords in this respect on reasonable terms. I would like to be the first man to undertake this work as a demonstration for others.

QUESTION 20.—MARKETING.—Trade journals in English and vernaculars should be published for the information of the cultivators and merchants. At present, information on market conditions is not available in towns and urban areas, on account of which the whole trade depends upon local conditions and the cultivators are often cheated and made to sell at low prices.

QUESTION 21.—TARIFFS AND SEA FREIGHTS.—The customs duties, both import and export, as well as sea freights have a great effect on the cultivators as they get prices for their produce according to their incidence. These duties should be levied or remitted according to the interests of

India and not of any foreign country. The development of agriculture and industry in this country, as well as in other countries, entirely depends upon these industries. In India, this question requires very serious consideration, for instance sugar, cotton, and similar other products cannot compete with other countries without State help and the regulation of customs duties for export and import.

QUESTION 22.—CO-OPERATION.—(*a*) (i) Much stress should be laid on training in co-operation in the Agricultural College, Cawnpore, from which recruits for the Co-operative Department should be selected by Government. Facilities for giving more money to co-operative societies should be provided by Government, on easy terms. There should be more staff from the side of Government to supervise the work so that the societies may have credit and the public may have sufficient faith in them to freely deposit money in such societies.

(ii) The members of the non-official agencies should bring to the notice of the public the advantages of the co-operative movement and the benefits achieved through co-operation in other countries, so that the public may be attracted to take part in this movement, purchase shares and become members. These members should devote time to supervising the work on an honorary basis, so that the societies may have better profits. Co-operation is necessarily the peoples' movement and unless non-official support and activities are forthcoming, Government single-handed cannot do much. All associations and societies which have the interest of agriculturists at heart, should co-operate in making the movement a success for, through this movement, the cultivator can be saved from the manifold miseries into which he falls owing to ignorance.

(*b*) (iv) I have been of opinion for a long time that the zamindars or the co-operative societies should be given power by legislation to collect water rates for irrigation, by means of power pumps, from the wells or tanks which they construct. At present, there are no facilities for them to collect such charges and therefore they are not inclined to invest money. Under sub-clause (ii) (*a*) of Section 3 of the United Provinces Tenancy Act III of 1926, the words " the construction of tanks, wells, water channels, and other works for the storage supply or distribution of water for agricultural purposes " are inserted, but it is not clear from them that, if any zamindar will supply water to cultivators at his own cost, he will be able to collect water charges like the Canal Department. If legislation is enacted to that effect, I am confident, that people will come forward to invest money gladly for this purpose.

QUESTION 23.—GENERAL EDUCATION.—General education in my opinion has the greatest bearing on agriculture as agricultural improvement has been greatly retarded owing to conservatism, lack of foresight and low standard of living, which are all outcome of illiteracy. In all agriculturally advanced countries education preceded improvement in agriculture or industries, as, by means of education, the cultivators begin to realise what is to their loss and what to their benefit, and to take interest in all matters affecting the improvement of their profession. I am of opinion that compulsory primary education should be introduced in the rural areas, and night schools should be started so that cultivators may not feel inconvenience in sending their children to school, and the courses of study should be so drawn up as to enable the pupils to become practical members of the village society and to carry on their profession. The view was expressed by His Excellency Sir Malcolm Hailey, Governor of the Punjab, in his opening the Punjab Educational Conference at Lahore, that the present growth of education did not exert on the minds of the people at large that general stimulus and broadening of mind that they hoped to see. Education would make real progress when the trader believed that it would make his son a more alert

man of business, when the agriculturist was convinced that his son would be a more skilful and energetic cultivator, when in short it was the general belief that education gave a man a better outlook and equipment in every sphere of life.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) At present the Assessment Rules and the Tenancy Laws stand very much in the way of capitalists investing money in land or agriculture. It is a well-known fact that if a man is not certain of getting a good return for his investment, he is not likely to spend money. Under the present circumstances both the Land Revenue Assessment Rules and the Tenancy Laws are such that they do not induce the money holders to invest money and therefore in my opinion the Land Revenue Assessment Rules must be brought under legislation and the legislative bodies must have control over the land assssment.

(*b*) The Land Revenue and Rent Acts, in every Province, are the main factors tending to discourage owners of agricultural lands from carrying out improvements. They require a complete overhauling in principle as well as in detail, so that people may be able to invest more money in them. This is one of the most important questions for the development of agriculture and I hope the Commission will give it their most serious consideration, as without capital no improvements in irrigation, manure, seeds, implements and expert labour can be procured.

QUESTION 25.—WELFARE OF THE RURAL POPULATION.—(*a*) (i) It is most necessary to improve hygiene in villages. The United Provinces Village Sanitation Act V of 1912, is of some use but it is not properly utilised as it requires many changes. At present there is no arrangement even for sweeping the village lanes. Everywhere you will find pits full of dirty mud and an accumulation of dirty water from wells. There are sweepers in every village, but as there is no system of payment to them they do not do this work, but live upon other kinds of labour.

(ii) Arrangements for fresh drinking water and milk supply.

(iii) Provision of prompt and efficient medical aid.

(iv) Provision of play grounds where village boys may play.

(v) Defence licences should be issued to responsible persons and an armed *chankidar* should be appointed in each village.

(*b*) Yes, I am strongly in favour of economic inquiry into the condition of cultivators and landlords and it should at once be taken in hand in some districts.

Oral Evidence.

39,503. *The Chairman*: Lala Sukhbir Singh, you are here on behalf of the United Provinces Zamindars' Association?—Yes.

39,504. You have provided the Commission with a note of the evidence that you wish to give; and you have also handed in a supplementary note, headed "Agricultural Note." Do you desire that that should be recorded as part of your written evidence?—Yes.†

39,505. Would you, first of all, tell the Commission what the objects of the Association may be?—The object of my Association is to improve agriculture all round, to safeguard the interests of the landowning classes, zamindars as well as cultivators, and to help the Government in legislation.

39,506. How long has your Association been in existence?—From 1896, that is about thirty years; and I have been its secretary from 1908. Before that my father was the secretary. I might also tell the Commission that I am a member of the Board of Agriculture, United Provinces, and I was a member for a long time of the Governing Body of the Agricultural College, Cawnpore. I am still a member of the Cattle Improvement Conference; and I am connected with almost all the agricultural movements in the United Provinces.

† See Appendix II, page 749.

39,507. On page 640 of your note, under the heading "Veterinary Research," you say that the animal diseases are becoming so varied and numerous that the practitioners do not even understand their nature. Do you think that the diseases are multiplying, or that more diseases are being discovered?—The diseases are multiplying; I mean to say that the old diseases are increasing very much.

39,508. No doubt your Association interests itself in the functions of District Boards. What have you to say about the finances of the District Boards in the United Provinces?—They are generally very good.

39,509. Have they enough money?—Yes.

39,510. Enough money to pay attention to the roads?—Yes; not only to roads but to everything; they do not, however, pay much attention to agriculture. The chief source of income to them is from agricultural cesses. Ten per cent. of the cesses goes to them, but they spend very little on agriculture. They spend all on roads and dispensaries, and little or nothing on agriculture.

39,511. Are you satisfied with the condition of the roads in charge of the District Boards?—Not at all; they are very wretched and very poorly kept up, and this is especially the case with the village tracks. In the rainy season, no carts can pass over them.

39,512. Let us take the roads under the District Boards first; the better class of roads under the District Boards are not properly looked after?—No.

39,513. How do you account for that?—There are several reasons, and one of them is the money question which stands in the way.

39,514. But I thought you told the Commission a moment ago that these District Boards usually had no difficulty about money?—They have plenty of money, but the question of distribution is the chief thing. If you possess a lakh of rupees and distribute that sum without careful attention, then the result must necessarily be *nil*. Both money and the proper distribution of it are essential. Formerly, the United Provinces Government used to give contributions to those Boards which were in deficit, but now, as far as my knowledge goes, every District Board is in a sound financial condition.

39,515. Would you turn to page 645 of your note. You say, "Recurring and non-recurring grants should be given by the Government to students of agricultural colleges and schools who start farms on modern lines, and control should be kept over such farms in the same way as over aided schools and colleges." I just want to clear up the point. Do you suggest that these grants should be given to students while they are at the agricultural colleges or after they have left?—After they have left.

39,516. That is to say, they would be ordinary farmers who had passed through the agricultural college?—Yes, those students who pass through the college should get some help to start their business.

39,517. But you use the word "recurring"?—Yes, I mean recurring as well as non-recurring.

39,518. You really suggest that Government should year by year hand over a certain amount of money to farmers who happen to pass through an agricultural college?—Yes, up to a certain time, and when the farmers become self-supporting, then there will be no need for any such grant. Government should give them some help in order to enable them to start their business or farms.

39,519. Would you turn to Question 8, Irrigation. At the bottom of page 646 in sub-paragraph (*b*), you say: "The existing methods of distributing canal water to the cultivators is not satisfactory, as water is not

supplied at the time when it is required and the quantity is not sufficient." Has you Association any views as to the possibility of extending in the United Provinces the practice of combining irrigation by well water with irrigation by canal-carried water?—I do not understand what you mean.

39,520. Do you know of instances where irrigation of any particular lands by canal is supplemented by irrigation from wells?—If I understand you aright, I may say that, when the Deoband branch in my district was opened, a condition was laid down that the canal water should not be supplied to those lands that were irrigated from wells.

39,521. Do you know of no case where, at certain seasons of the year, canal water is available and is used on the same land on which well water is used at other seasons?—It could be used. My point was that there were hundreds of wells to irrigate the land, and it was made a condition that no canal water would be given to those lands, but gradually canal water was given and those wells are out of order.

39,522. But why should cultivation not be carried on by well irrigation at such times in the year as the canal-carried water is not available?—Because the tenants have no means of taking the water from wells. Once they get canal water, they sell everything; they do not keep the wells in order and they cannot bring them into use at once, for that would mean a lot of expenditure.

39,523. You do not think that the two methods can be combined?—It is very difficult.

39,524. Do you not know that such cases exist?—Yes, they do exist, but they are very few.

39,525. On page 649, in answer to Question 12, you deal with the question of cultivation; you say the existing system of tillage is defective as the tillage is not deep enough for want of good and sufficient number of bullocks. You suggest there that the limits of the tractive power make it difficult to introduce more efficient agricultural implements?—Yes.

39,526. Is it a question of shortage in the number of bullocks available, or is it a defect in the quality of the bullocks available?—Both, the number as well as the quality.

39,527. Is there a shortage of bullocks?—Yes, a great shortage.

39,528. What is the price of a pair of plough bullocks in the United Provinces?—The average price at present may be taken as Rs.200 for an ordinary pair of plough bullocks; for a good pair the price goes up to Rs.400.

39,529. Has the price risen of recent years?—Yes, within my knowledge it has gone up four times.

39,530. And you tell the Commission there is a shortage of working bullocks?—Yes, I think the number of bullocks at present used by the cultivators is about one-quarter what it ought to be.

39,531. Do you suggest that four times as many bullocks as are at present in work might be used?—Yes, at least four times are absolutely required.

39,532. *Mr. Calvert*: The figures given to us indicate that you have twice as many bullocks as you require in the United Provinces?—No.

39,533. *The Chairman*: I wish to know how your evidence-in-chief should be interpreted. That is your view, that you could with profit use four times the number of bullocks that you are using in the United Provinces?—Yes.

39,534. On page 650, you suggest that the export of serum should be prevented. Do you found yourself on the fact that occasionally serum is not available in the United Provinces? Is that the position? Have

you known cases where serum is not available?—No, I have not come across such cases.

39,535. Then I do not quite see why export should not continue if there is no shortage in India?—Because so many cattle have to be killed in the preparation of the serum which is exported. When there is already a shortage of cattle in India, why should they be killed to prepare serum that is to go out of India? I have myself been to Muktesar and I have seen there how cattle are killed and how serum is prepared; I think the export should be stopped; we should only prepare as much serum as is required in the country.

39,536. On page 652, you are dealing with the problem of forest areas in relation to agriculture, and you suggest that the quantity of fodder available might be increased by making arrangements to produce fodder crops instead of grass; do you mean fodder crops in the forest?—Yes, wherever it may be possible.

39,537. What sort of fodder?—Ordinary fodder for the use of village cattle; now no fodder is grown there.

39,538. I want you to tell the Commission what crops you are thinking of?—There are many kinds of grasses that are now coming to notice from other countries.

39,539. But you say fodder crops instead of grass; do you mean they should plant fodder grasses in place of the wild grasses at present growing? Is that the idea?—No, my idea was that, instead of wild grass, if some better class of grass or fodder were grown, it would be more useful for the village cattle. The present grass is very useful, but if some superior kind of grass or fodder were grown, it would be more useful; that is my idea.

39,540. On page 654, under Question 24, which deals with the problem of attracting capital to the land, you suggest that the Land Revenue and Rent Acts in every Province are the main factors tending to discourage owners of agricultural lands from carrying out improvements. Will you please develop that?—As far as my opinion goes, I think the present land revenue and tenancy laws are most defective and require overhauling; my opinion is, that as long as these laws and regulations remain as they are, you will not be able to get more investment in land. You see, every investor and moneylender wants some return for his money, either in the shape of interest or produce; when there is no certainty of a return I do not think anybody will come forward and give us money for the improvement of agriculture. At present the laws and regulations about land assessments are quite vague and uncertain; the whole thing depends upon the Government; there is no Act on the subject. A Parliamentary Committee very strongly recommended legislation; in the United Provinces a Bill was drafted, but it was withdrawn by the Government, I do not know why. Of course, they advanced some reasons, but I do not agree with those reasons. When the Bill was drafted it ought to have been passed, but the Bill was withdrawn and the position is now as it was before.

39,541. If I understand you aright, I think your suggestion is that the uncertainty of what exactly the assessment is going to be is one of the disturbing factors?—Yes, quite.

39,542. Does that disturb the landlord as well as the cultivator?—Yes, both of them.

39,543. Would your Association be in favour of a tax on agricultural incomes?—No.

39,544. That would enable you to know exactly where you stood, would it not?—If land revenue were remitted and an income tax put on all incomes, I do not think we should have any objection.

39,545. Do you speak with the authority of your Association on that point?—No, I speak on my own personal authority; in my opinion, it will go a long way towards facilitating matters if the land revenue is remitted altogether and income tax is put on all incomes, as is the case in England.

39,546. *Sir Ganga Ram*: What share of the gross produce does Government take now?—Government takes about one-quarter of the produce of land.

39,547. Of the gross produce of the land?—Yes.

39,548. They say they only take 2 per cent.?—Do they give any facts and figures?

39,549. They have given that as an average, that they only take 2 per cent.?—There may be some misunderstanding.

39,550. It is a very vital question. What share of the gross produce does Government take now in the form of land revenue?—I think it takes about one-fourth. If you put the value of the produce at Rs.200 per annum, the Government will take Rs.50.

39,551. *Sir Henry Lawrence*: Are you aware that there is a discrepancy between your estimate of 25 per cent. and the Government estimate of 2 per cent.? Were you aware of that discrepancy before?—I have just heard of it from Sir Ganga Ram.

39,552. Did you not know before that Government's estimate was 2 per cent. of the gross produce?—I have never heard that before. It is quite absurd.

39,553. You have never enquired into it?—No one can say that it is 2 per cent. of the gross produce.

39,554. Is that not on record in the various Settlement Reports?—I have not seen it.

39,555. Have you seen any Settlement Reports?—Yes, hundreds of them.

39,556. Is it not stated there?—No.

39,557. *Mr. Calvert*: What proportion of the gross produce is taken as rent by the landlord?—Generally about half. If the gross produce is worth Rs.200, the rent will be Rs.100.

39,558. What is the Government order as to the proportion of rent which is to be taken as land revenue?—I am afraid I do not understand the question.

39,559. Land revenue is taken, not on the gross produce, but on the rent. What proportion of the rent does Government take?—It varies according to the district. The rule generally followed is the Saharanpur rule, which is 50 per cent.

39,560. *Dr. Hyder*: Is the Saharanpur rule followed? Does the proportion reach a maximum of 50 per cent.?—It goes even to 55 per cent. in some cases. I have seen that myself. The general rule is to make assessments from 45 per cent. to 55 per cent.

39,561. I thought that was the theoretical limit?—No, it is not only the theoretical limit but the practical limit. The general rate for land revenue at present is about 50 per cent.; the Saharanpur rule is usually followed.

39,562. *Sir Henry Lawrence*: The Government themselves say that the maximum percentage of rent on gross produce is 17 per cent.; the rent varies from 5 per cent. to 17 per cent. on the gross produce?—I have not worked out these figures; but, as far as my knowledge goes, the rental is Rs.100 out of Rs.200 and the Government revenue is Rs.50 out of Rs.100.

I say ordinarily; there are, of course, exceptions; but generally, I understand, the rental is half of the gross produce and the land revenue is half of that.

39,563. We went to a private farm on which the value of the gross produce was Rs.200 per acre and the land revenue was Rs.3 per acre?—It might be so in Bengal, where there is a permanent settlement.

39,564. Is not the land revenue in these Provinces, on an average, Rs.2 per acre?—It may be so, but that is Rs.2 per acre and not a percentage on the produce.

39,565. You say that the value of the gross produce is only Rs.8 per acre?—No, I do not say that.

Yes, because if Rs.2 is 25 per cent. of the total, the total must be Rs.8.

39,566. *The Chairman*: You are giving evidence on a very important subject, and if you are not clear on the point, I suggest that you reserve your answer and let us have it in writing*?—That will be better, because it is a very important question. I am told by Sir Ganga Ram that Mr. Lane, who was a Settlement Officer in my district, has stated that it is only 2 per cent. of the produce. I think he wanted to say that it was Rs.2 per acre. There is some misunderstanding there. I should like to see these papers and then say what is, in my opinion, correct.

39,567. And, perhaps, you would reinforce your views by one or two concrete instances*?—Yes.

39,568. *Sir Ganga Ram*: You know that partition of land is now governed by the Hindu law of inheritance. What are your views on that? Is that in the interests of the country, or should it be stopped at a certain stage and the law of primogeniture applied?—That is a very difficult question. My opinion has always been against partition. I am not in favour of partitions and divisions. They are ruinous.

39,569. At what stage would you put a limit to partition? Would you stop it altogether?—Some standard ought to be fixed below which no partition should be allowed.

39,570. That is a very important question?—Yes.

39,571. If you like to reserve your answer you may do so?—My clear opinion is that as far as possible no partitions and divisions should be allowed.

39,572. That is an important qualification?—It not only affects holdings, but also property.

39,573. *Professor Gangulee*: What is the view of your Association about partition? Is the view that you are expressing now your own or that of your Association?—There are two questions, the partition of property and partition of holdings. About the partition of holdings, the view of the Association is that holdings should not be divided. About property, the Association has not been consulted as yet; it is my personal opinion that property also should not be partitioned.

39,574. *Sir Ganga Ram*: What property? Landed property?—Yes.

39,575. *Sir Thomas Middleton*: Have you got working cattle of your own? How many pairs do you keep for your land?—Generally we get four bullocks for about 100 *bighas* of land.

39,576. That is about 20 acres?—Yes.

39,577. Two bullocks for 10 acres?—Yes, generally speaking.

39,578. How many days' work in the year do the bullocks do? Are they working four, six or eight months in the year?—It depends upon the quality of bullocks and also upon the nature of the soil and the work.

* Not received.

39,579. I am asking about your bullocks. How much work have you got for them?—I think there is so much work that they cannot finish it. They are always working.

39,580. How much food do you give to your bullocks?—I allow one seer of gram for every bullock, and sufficient *bhusa* or *chari* or grass from my gardens and farms.

39,581. Do you give them one seer of gram every day?—Every day.

39,582. Do you give them more food when they are working harder?—No, we give them that every day.

39,583. Do you allow anything for your milch cows?—Yes.

39,584. How much?—We allow them some barley also and some *khal*.

39,585. If a cow is a good one, how much would you allow?—If the cow is a big one, it requires more and less if the cow is a small one.

39,586. Suppose a cow is giving five seers of milk a day. How much would you allow it?—To a cow giving five seers of milk a man will give at least eight or ten annas worth of gram, *bhusa*, etc. If the milk sells at four seers to the rupee, a man gets Rs.1-4 for five seers, out of which he will spend, say, half, or 12 annas, in feeding the cow, and the rest he will keep for himself. That is the common custom here. But generally the cattle are not properly fed. There is not sufficient fodder or *bhusa* and gram is very dear. When the people cannot afford to fill up their bellies, how can they properly feed their cattle?

39,587. I think I heard you say there are not enough cattle in the country?—That is so.

39,588. But if you do not feed those you have, how are you going to have additional cattle?—As population is increasing and God is feeding them, so increased cattle will be fed by God.

39,589. That is too simple a solution?—It is the simplest, and nobody can deny the truth of it.

39,590. You say that you keep a pair of bullocks for every ten acres. Supposing you employed two pairs of bullocks for every ten acres, could you make good use of them?—Yes, we could grow better crops.

39,591. You think you are under-cultivating your land?—Yes.

39,592. *Sir Ganga Ram*: Are you speaking of irrigated land or dry?—Of land irrigated by wells and canals.

39,593. Can you do with two bullocks for ten acres on well-irrigated land?—We cannot do, but we cannot afford to keep more. I think that we should have better bullocks and more bullocks so that land may be properly ploughed, properly tilled and properly manured, but the fact is the tenants cannot keep a sufficient number of bullocks or bullocks of good quality.

39,594. *Sir Thomas Middleton*: That is because they do not feed them properly?—They cannot feed them. They have no pasture or sufficient fodder or sufficient cheap grain. Even salt is taxed.

39,595. I heard you suggest that fodder crops should be grown on waste land. Why do the owners of the bullocks not grow fodder crops?—There are many difficulties in the way, such as the Land Alienation and Assessment Rules.

39,596. Is it because it does not pay them?—That is one of the reasons, of course.

39,597. What are the other reasons?—The other reason is that they cannot get big plots of land. What they get are small and scattered plots here and there. There are rights of various kinds, occupancy rights and non-occupancy rights, which stand in the way. I am a big zamindar and I cannot have 200 acres of land at one place for my own cultivation.

39,598. Then, with all these difficulties, it is clear that if the cultivators had more cattle they could not feed them?—They could grow better crops.

39,599. But they do not feed those they have got?—They cannot grow more; their holdings are not sufficient in number; they have to grow wheat and sugarcane, etc., and then on whatever poor lands they have they grow fodder.

39,600. *Professor Gangulee*: Has your Association taken any active interest in the co-operative movement?—The Association is in favour of this movement, but it has not taken up co-operation because in the district of Muzaffarnagar very little has been done in this respect. The Association is doing what it can, but I cannot say that it has done enough. The work there has only recently started and there are only about fifteen or twenty banks. There is no district bank as yet started. There is lack of money in these banks, for the cultivators want a lot of money for bullocks, seed and for sinking wells which these banks cannot afford to give.

39,601. Have you any primary societies in your villages?—I have these banks in several of my villages and I am doing my best to help them. I am one of the Directors.

39,602. *The Chairman*: Do you mean banks or primary societies?—I mean these village banks.

39,603. *Professor Gangulee*: I mean a primary co-operative society, a society from which the cultivators can borrow money?—We call them village banks in the United Provinces. There are several banks in my own villages and I am taking an interest in the movement; but, in many districts, little has been done up to now.

39,604. *Mr. Calvert*: You say that lakhs of cows are killed by the Military Department. Have you any figures?—I do not remember them now, but I moved resolutions and put question after question in the Council of State as well as in the United Provinces Legislative Council, of which I was a member for twelve years, to try to stop this indiscriminate slaughter of cows. I do not remember the figures at present, but this much I can say, that cows below the age of five years are generally killed in the cantonment slaughter houses.

39,605. You do not know that the Military never slaughter animals under five years in age?—They slaughter animals under five years of age.

39,606. Their order is not to slaughter animals below the age of five years; you have not heard of that?—No.

39,607. Have you actually any figures of actual slaughter for the British Army?—I have not collected them.

39,608. Do you think the slaughter of cows for the British Army in the slightest degree affects the total mortality of cattle in this country?—Yes, greatly.

39,609. To the extent of ·1 per cent.?—It will go more than that, in this way, that the prime cows are slaughtered before they have any issue.

39,610. Do you think the slaughter of cattle for the British Army increases the mortality of cattle in this country by 1 per thousand?—There is no question of mortality. The question is that, in cantonments, cows under five years of age are killed.

39,611. You do not know that there is an order that cattle under five years should not be slaughtered?—I have never heard of it.

39,612. *Professor Gangulee*: Do you know of any import of Australian beef into this country for the use of soldiers here?—I think a certain quantity is imported; but the Commander-in-Chief said that if Australian beef is imported here it will cost much more than what they have to spend on the country beef.

39,613. Still they depend on the import of Australian beef?—There may be import to a certain extent, but not much.

39,614. *Raja Sir Rampal Singh*: You have told us that District Boards have got plenty of money, but the distribution of it is not properly made?—Yes.

39,615. May I ask you on what items do they spend more than is required under the present circumstances?—My submission is that District Boards ought to spend some money on the improvement of agriculture also as well as on roads, schools, dispensaries, and so on; but they do not give any attention to the improvement of agriculture at present. If they want to they can do that under the present circumstances.

39,616. By curtailing allotments on other items?—Of course that will have to be done; cuts will have to be made here and there.

39,617. Are they now expending more on certain items although they ought to spend less on them?—Yes; the whole question requires examination. My idea is that the distribution of money is not properly done. The income is sufficient because the cesses are going up in every district. As land revenue is increasing, the cesses are increasing too and my submission is that the distribution of money is not properly made.

39,618. Have you found out that there is any item on which they are expending more than they ought to?—I was a member of the District Board for many years. I do not remember the figures now; but, so far as I remember, there was no percentage fixed for expenditure on any department. There is some rule with regard to the Department of Education that the expenditure on that should be 8 per cent., or something like that; but as far as the other departments are concerned, there is no rule, no principle. The budgets can be prepared according to the whims and wishes of the Secretary or the Chairman. Most of the members do not know how the budget is framed, how the money is allotted; only a few know. It is not only the case with District Boards but it is the case everywhere; even in the Government we find the same thing.

39,619. You said that out of a gross income of Rs.200 the cultivator has to pay a rent of Rs.100. May I ask you how much the cultivator has to spend in order to get the gross produce of Rs.200?—I cannot give you the exact figures. But he has to spend money by way of canal dues, upkeep of bullocks, labour, seed and so on, and I think all this will come to Rs.50 or even more. That is if he gets Rs.200, he will pay Rs.100 out of them and spend Rs.50 or more on the other items and the rest he keeps for his own requirements. The poor man cannot save much.

39,620. There is no margin left for him?—Very little margin. The man has to work day and night and sometimes even the women and children work, and they are very poorly clad and very poorly fed, and for marriages and other things he has to borrow. In my knowledge, about 90 per cent. of the cultivators are in debt although many of them are occupancy tenants.

39,621. *The Chairman*: Would you like to tell the Commission one or two things which your Association has done in order to forward the interests of agriculture?—My Association is taking a very great part in the Government demonstration farm at Muzaffarnagar. The Government had an idea of abolishing the farm, but since the scheme put forward by the Association was accepted, it has begun to pay; the Association is taking active part in all directions.

39,622. *Sir Henry Lawrence*: On page 652 of your note, you deplore the importation of foreign sugar?—I find the imports are increasing.

39,623. You think they ought not to increase?—Of course.

The Honourable Lala Sukhbir Sinha.

39,624. Do you wish to have some protective duties to stop them?—At present, there are some duties.

39,625. Do you wish to see those duties increased?—It is a question to be thought out, whether these duties should be increased or whether we should have more factories in the country to compete with foreign sugar.

39,626. What is your advice on the matter?—My advice is first of all to increase our own sugar production. Steps should first be taken to increase our own sugar industry so that we might not be in need of foreign sugar; and, in order to give an impetus to the local industry, there ought to be some protective duties; if they are not sufficient at present they should be increased.

39,627. At present the duties are for revenue purposes and your advice is that they should be made protective duties for the purpose of protecting the manufacture of sugar in this country; is that so?—Yes. Before I conclude, I want to invite the attention of the Commission to the book written by Dr. Voelcker, which I have in hand. He has made in this book many recommendations and has indicated what is required for the improvement of agriculture in this country.

(The witness withdrew.)

CHAUDHURY MUKHTAR SINGH, M.L.A. Pleader, Meerut.

Replies to the Questionnaire.

QUESTION 2.—AGRICULTURAL EDUCATION.—(i) No.

(ii) In the whole Province, extension of teaching facilities is badly needed. The existing arrangement is neither efficient nor sufficient.

(iii) Yes. The teachers in order to be useful should have a first hand personal knowledge of the rural conditions under which a farmer has to work. It is then, and then only that the teacher will be able to grasp the farmer's point of view, and advise his pupils on the right lines.

(iv) The boys who attend these institutions do not go there with the idea of learning and following in their after life the profession of farming, but they go there with the sole idea that by undergoing instructions in these institutions, they will be in a position to obtain some job in the Agricultural Department or elsewhere. I know a number of students who have got very large tracts of land of their own at home and who are in a position to invest their money in farming, but have not the courage to take to the profession after completing their career at these institutions. They have taken to service on very low salaries. This shows that either the instruction given in these institutions does not sufficiently equip them with the information required for successful farming or the students lose their self-confidence. I know the case of a few people, who, after completing their courses both at vernacular schools and at the Agricultural College, took to farming and have miserably failed and were obliged to take to service.

This shows that there is something wrong somewhere in the instruction imparted or the training given at these institutions. Even if one student after finishing his career at the school or college becomes successful in his own farming, there is a chance of attracting a number of boys to these institutions. Personally I would suggest that a degree course in agriculture should be created in all the Universities of the Province, and students taking up agriculture as their subject, should in no way be considered inferior to those who have taken up an ordinary Arts or Science course for their degree examination. A graduate in agriculture would be a better revenue or civil officer than one who has studied Science or Arts. If we have a number of agricultural graduates as officers, the ideas of improved

methods of agriculture will filter down to every big zamindar who has a chance of meeting these officials, and a better understanding of the circumstances of the masses will be acquired by the officials. The science of agriculture is in no way inferior for developing the human intelligence to other sciences like mathematics, physics or chemistry.

If the idea is once conceded and agriculture is introduced as a subject in colleges and schools, I am sure the whole ideal of education will change, and we shall have really useful institutions in the country.

As regards special schools and colleges for teaching agriculture, I must emphasise the fact that the instruction at them should be given through the medium of the vernacular. The Government experts should disabuse their minds of the idea that the Indian vernaculars are fit only for giving a rudimentary instruction. If this be admitted, decidedly a better and more useful practical course of study would be prepared for vernacular schools of agriculture. Further, I may mention that at all these schools an arrangement of holding short classes for teaching the adult farmers should be held. The duration of such classes should not be more than a week and also an arrangement for extension courses, i.e., agriculture taught by correspondence, should be made at these schools. What should be taught and what should not be taught at these schools is a matter of detail, and this is not the place to discuss it.

As to the Agricultural College, its control should be in the hands of the University and not in the hands of the Department of Agriculture. The Government of the United Provinces admitted the soundness of this view several times and it promised to give it practical shape more than once, still the actual transfer of the college to the University has not taken place, and there seems to be no likelihood that it will take place in the near future. Unless this is done, men with sound training in scientific agriculture will not be available and without this reform the prospects of extension of sound agricultural education will not be improved.

If, now, a sufficient number of boys are not attracted to these institutions, it is not the fault of the people but that of the education itself. The sooner the changes are effected the better.

(v) Service.

(vi) Not generally, but even where they are drawn from the agricultural classes, the incentive is the same. A student who reads at the school (primary, middle or high school) becomes unfit to follow any other walk of life except service. He becomes physically unfit to take to any profession requiring manual labour. A disgust towards manual labour is created, and the education, being mostly through the medium of a foreign language, puts a great strain on the mental faculties of the student and his health is undermined. Thus, even if all the boys are drawn from the agricultural classes, the object will not be achieved.

(vii) As already mentioned in answer (iv), the whole of the curriculum, the whole ideal, has to be modified. The boys should not be stuffed with theoretical knowledge, but they should give sufficient time to practical training, and should be forced to work as labourers in the fields with their own hands and to look after the cattle and implements themselves. I wish that a boy or a number of boys should be put in charge of bullocks and a plot of land for their own experiments, without any labourer to help them.

(viii) (*a*), (*b*) and (*c*) I have no faith in (*a*) nature study nor in (*b*) school plots. The teachers who are asked to teach these subjects have neither sufficient training nor sufficient capacity to teach these subjects. It is simply a farce, waste of time, money and energy.

I am in favour of having farms attached to every school, provided the course of study at the school be so amended as to give a sort of vocational training. The teachers, in that case, will have to be specially trained in the subject of agriculture, so that they may take pleasure in working

up these farms with their students. The only precaution to be taken would be to prevent the teachers from turning it into a private business of their own.

(ix) The majority of the students have taken to service in the Agricultural Department, and others, who could not secure a job in the Department, have had to take up to other service in other departments which have no connection with agriculture.

(x) Agriculture can be made attractive to the middle-class youth, provided there be educated people taking to agriculture, and it can be shown to the world that the educated farmer gets more than an uneducated one. It would be a great incentive if some of the Government officials serving in the Department of Agriculture were to take to farming after retiring, but I am sure they would prefer to serve in some State rather than risk their time and money in following the profession.

(xi) No, not to my knowledge.

(xii) Adult education in rural tracts can be popularised by introducing night schools, half-time schools, by publication of good books in the vernaculars of the Province and by holding short and extension courses. The course of study, for night schools and half-time schools, should consist of ordinary reading and writing, working out small sums in arithmetic, and agriculture. After the ordinary course of education at these schools is completed, there ought to be an adequate arrangement for keeping up their knowledge up-to-date. There should be libraries to achieve this object. The Government should see that good books on agricultural subjects are published and the authors encouraged by making purchases for these libraries. No attempt has so far been made to get good books written on agriculture. It will be surprising to know that, under confidential orders, the editors of agricultural journals and agricultural officials are prohibited from writing reviews on books written by private persons. Every attempt is made to discourage rather than encourage such literature. Private attempts to publish such literature are bound to fail if people are discouraged from taking up this work. The literature produced by the department through journals is simply third class and worthless. The agricultural journals should contain subjects of a higher standard than they contain now.

(xiii) (*a*) The administration of the vernacular agricultural schools should be in the hands of District Boards, but, as far as high schools or diploma schools go, the administration should be in the hands of the Intermediate Board of Education. The college education should be in the hands of the University.

(*b*) The finances of the schools under District Boards will be under the control of the District Boards and grants will be given by the Government as in the case of other schools, and the finance of high schools and the college will be done by Provincial Governments helped by the Imperial Government.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—(*a*) The most successful measure in influencing and improving the practice of cultivators is that of introducing practices at some private farm of a cultivator or a zamindar. If found successful, they would be at once taken up by cultivators, provided it were within their means to follow them. Demonstrations given at Government farms are not taken up by the cultivators for two reasons, firstly, they are conducted by people of more intelligence and money, and secondly, the cultivator considers that the advantages of the practice advocated are very much exaggerated. Besides, he considers that it is beyond his means to follow a practice taken up at the demonstration farm.

A non-official agency invokes more confidence than an official agency. I consider, therefore, that the best method for propaganda would be to

give small grants sufficient to make good the loss that might be incurred in case of failure of experiments on private farms. The Court of Wards can be utilised to introduce improved systems of agriculture in estates under their management. Jails are very good places in which to teach the system of improved agriculture to the adults.

(*b*) The method of field demonstration, as followed at present, is very extensive and can hardly be managed by the number of demonstrators employed. Demonstrators are unable to devote sufficient time to watch the results of their demonstrations and thus the demonstrations are not very encouraging. I would suggest that a *pargana*, or a few villages in a *pargana*, may be the centre of activity for a demonstrator, and he should devote his entire energy to field demonstration in that area. The demonstrator should change his field of activity when the practices advocated are fully understood by the people of the area in which the demonstrator has begun his work. It does not matter if it takes long to popularise a certain practice in the whole district. I do not believe in the general assertion that the Indian cultivator is conservative in adopting a new suggestion. I have seen people taking to a new suggestion at once, when they came to have confidence in the man who suggested the practice, and when they were convinced that it was within their power to adopt the practice advocated. The fact is that there is very little which the demonstrators can give to the cultivator. The seeds advertised and the implements advocated are sometimes not believed to be better, even by those who advocate their use; but, as I have suggested elsewhere, the demonstrators are at certain times forced to advocate what they do not believe themselves to be useful and beneficial and naturally they do not have the same enthusiasm about those practices. The second defect is that circles are divided without any regard to climate, soil and seasons and the area under a circle is very extensive; when any practice is found to give good results in any year at a farm, it is considered to be a good practice for the whole of the circle. This is decidedly a wrong method. We should make it a point to know under what circumstances a certain practice or seed will be useful and we should advocate that practice or seed for the same set of circumstances. While advocating a new seed or a new practice, we should fully analyse the merits and demerits of the same, and without hesitation give out true facts as they have been found to exist. I have not found any demonstrator giving the demerits of new seed or new implements. He rather sees nothing but good and good only in the new seed or the new implement and he recommends the new seed or the new implement for every soil and climate. Personally I cannot believe that any implement, seed or practice of agriculture would be useful everywhere irrespective of differences of climate, etc. These are necessary factors to be taken into consideration in such matters. If the above precautions were taken, I am sure the method of field demonstration would be very much liked by the people.

(*c*) The expert has simply to convince the cultivator that the method advocated comes from one who is easily accessible to him and with whom he can talk without reserve.

When a new disease appears or a natural calamity visits the poor cultivator, the expert has the best chance of showing his ability. I may be excused if I say that the experts do not care to gather local experience as much as they ought to, and they do not like the idea of mixing with the cultivator and realising his difficulties, and therefore, naturally, the suggestions that they make are mostly beyond his intelligence and means. A better understanding between the cultivator and the expert is necessary before you can expect the cultivator to refer his difficulties to him and to follow his advice. The Indian cultivator being illiterate and poor does not know whom, and how to approach, and secondly, if he approaches he cannot have a free discussion with the expert as he cannot explain his

difficulties in the terms of the expert's ideas, nor can the expert explain himself in the language of the cultivator.

(*d*) A striking instance of success is the adoption of three rollers cane-crushing mills. As soon as it was proved that an iron cane-crushing mill was better than a wooden mill, it was at once adopted by the cultivator throughout the whole Province, wherever the cane crop was growing. In the same way, the boiling pans consisting of one piece are replacing the old boiling pans consisting of small pieces riveted together. A third instance of striking success is the adoption of a new furnace for boiling cane juice in the Meerut district. As to striking failures, I can give an instance of Mr. Hadi's system of sugar boiling. The department advertised the system as much as it could but everybody who followed it was a loser. It was only after great difficulty and public criticism that the practice was condemned by the department itself.

QUESTION 4.—ADMINISTRATION.—(*b*) No. If there is any necessity of increasing the staff in a Province, the Provincial Government should be the final arbiter. Personally, I do not like the idea of having a number of services under the control of the Imperial Government and given to the Provincial Governments. Every subordinate of the department should be subordinate to the Provincial Government and his salary should be votable by the Provincial Council. The system, as it exists now, is very objectionable. Some of the high posts in the department are held by Imperial service men who do not consider themselves to be subordinate to the Minister or to the Provincial Government. That creates a sort of dissatisfaction in the minds both of the subordinate and of the Minister. This anomaly should cease and there should be a perfect provincial autonomy, as far at least, as the transferred subjects are concerned.

It is never advisable to have scientific experts under the Imperial Government and lend their services to the Provincial Governments or to put them on special duty in a Local Government. The Provincial Governments should be free to decide what sort of investigation they require and whom to engage for the investigation of the problem.

(*c*) (i) No. The Agricultural and Veterinary Services are not giving as much service as they could give. The causes I have dealt with in detail elsewhere, but the main cause as regards the Agricultural Service is that there is a great deal of centralisation and the subordinates are not given a free hand to acquire knowledge for themselves and to advocate practices, of the soundness of which they themselves are convinced. They receive instructions for every minor thing from above. As to the Veterinary Assistants, they are lent to District Boards and are under the control of the Provincial Government. The result is that diarchy does not work properly and there is always a conflict between the officers and District Boards. As to the services of dairy experts and the cattle breeding section, it is a new thing started in the Province and it is too early to express any opinion.

(ii) Railways are not benefiting the cultivator, as much as they might. The freight charges for trade within the country from one place to another are very high and sometimes prohibitive, which forces the cultivator to send articles from one place to another by bullock-cart instead of by rail. Rolling stock in the busy seasons is generally not available in sufficient quantity. The freight charges on fodder and implements should be very low, so that in days of scarcity of fodder the cultivator might be relieved of his difficulties to some extent. Implements manufactured in the country have to pay much higher rates than an imported article from a port to any station in the country.

The charges of steamers are very low in comparison to railways and this is why no industry can compete with an imported article. The Railway Board should make it a point to give special rates from the place of manufacture

or the place of export of agricultural produce to important markets in the country, so that agricultural produce and implements may have free movement, at least in the important centres of the country.

There are very big areas lying practically waste which have no connection facilities and which can provide a large amount of fodder and fuel. This is especially the case in regard to the area lying on the banks of the Ganges *khadar*. If a branch railway line were constructed at a distance of some miles from Ganges and parallel with the Ganges, the whole *khadar* area would be linked up with the *bangar* area and the fodder difficulty would be removed to a very great extent. There is also a likelihood of improving the agricultural conditions of the place. In Meerut district alone, thousands of acres of land can be very well utilised. Fodder in this part is available at a very nominal price but by the time it reaches the city the cost of cartage becomes sometimes higher than the price of the fodder itself. I am sure the same would be the case elsewhere.

(c) (iii) The *pucca* roads in the Province are not of sufficient length. A regular survey of every Province should be made and a programme for building *pucca* roads in every district be decided upon as soon as possible. Good communication is the secret of agricultural improvement. Not only do the markets become accessible but, at the same time, the general condition of the people is very much improved on account of their coming into contact with the people of other places. I learn that the Punjab Government have decided to build up a number of miles of *pucca* roads every year. The same scheme may be adopted by other Governments but I do not consider that there is likelihood of this being done by Provincial Governments unless they are sufficiently helped by the Imperial Government.

In order to make a successful attempt and to cut down maintenance expenses of *pucca* roads it seems necessary that some metal other than the *kankar* nodule should be found. In the first place the *kankar* nodule is not available in sufficient quantity in each district and, secondly, the heavy traffic impairs the road and shortens its life, thus increasing the cost of annual repairs. The life of roads has been reduced in the last decade from six years to four years and I am sure it will be further reduced to three years in the next decade. The engineers should decide upon the metal for different districts in accordance with the local conditions and the availability of the material. I may be allowed to mention one point more in this connection. During the last 25 years the engineers have reduced the breadth of *pucca* roads from 12 to 9 feet. This has further shortened the life of roads and has increased the maintenance charges enormously. I consider it to be a mistake to shorten the breadth of *pucca* roads. Whatever we save in the initial cost, we spend much more in the maintenance.

In order to relieve traffic over *pucca* roads and in order to reduce maintenance charges, I would suggest that a portion of these roads be set apart with a fencing on one side for running heavy lorry traffic on iron rails and the monopoly of running these lorries be made over under certain rules and conditions to some reliable men for five years. If the monopoly be allowed the contractors will be perfectly willing to pay a decent amount annually, and this amount will go towards the upkeep of the roads.

By extending the length of *pucca* roads in every district, the income of railways will be very much increased and therefore the public has a right to demand a certain percentage for this improvement from the railway head.

The *katcha* roads are in a very bad condition. Every year they are washed away and they become lower and lower. There seems to be no method of improving them easily. All these roads should be made *pucca* as soon as possible. The village tracks are daily encroached upon, and the village communications are suffering very badly. I consider the time has come when by law all these village tracks should be acquired by District Boards and maintained by them. If only the encroachment is made penal, I am sure

the conditions will improve. Under present conditions nobody is the owner of a village track and therefore every owner of the adjoining field considers the land to be his, and gradually includes the land into his own field. The Government should arrange, through District Boards for the demarcation of these tracks as soon as possible and the demarcated portion should vest in District Boards. The village panchayats should be held responsible for keeping these tracts intact.

(*c*) (iv) From the agricultural point of view, the Meteorological Department is of no good. The forecasts are generally wrong. There is no co-ordination between the Meteorological Department and the Agricultural Department. The department should be better equipped if it is likely that its forecasts will benefit the farmer. If, on the other hand, the conditions of the country are such that no forecasts are likely to be reliable it is no good spending money over the department, from the agricultural point of view.

(*c*) (v) The postage on postcards and envelopes should be reduced and I am sure that, by so doing, the income of the department would go much higher within three years. Even if it does not go high, the Government should restore the old rates.

The postage on letters written for the same district should be further reduced. This will considerably increase the number of letters and consequently the income. The parcel rates on agricultural samples should be reduced and bigger parcels should be received by post.

(*c*) (vi) The rates of telegrams, especially business telegrams, should be reduced to 6 annas. The telephone charges also are very high and should be considerably reduced. I consider the time has come when private companies should be encouraged to take up this enterprise and put up their own telephones.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—(*a*) (i) The main cause of borrowing is litigation. The responsibility for litigation rests on *patwaris*, *kanungos* and the police, and improper legislation and the rulings of higher courts. The Revenue Department, as far as these subordinates go, and the subordinate police require complete overhauling. The Government should have better responsible officers to look after these subordinates. The attention of Government has been several times invited to them and still it is a cry in the wilderness. The other cause of indebtedness is that agriculture is the main-stay of the people in general. Whenever and wherever a crop fails there is no other job for the people to fall back upon. Thus we find that there is famine practically once in every fifth year and the four years' hard labour of the cultivator is hardly sufficient to make up the loss sustained from one year's famine. The cultivator is not well protected to fight against physical calamities. The third cause of indebtedness is the illiteracy of the cultivator. If a cultivator is once entangled in the clutches of an unscrupulous moneylender, he can hardly ever get out of them. Not only he is to guard against the sharp practices of the moneylender but he is also to guard against the misleading advice of a more or less educated villager who earns his living by acting as a legal adviser. Half-educated people in the village are more dangerous than illiterates. If an attempt be made to widen their source of knowledge after finishing their education, through moving or stationary libraries, the evil may be mitigated to some extent.

Generally indebtedness is considered to be due to marriage and funeral ceremonies and other luxuries. This may be correct in the case of zamindars but it is incorrect in the case of cultivators. Besides, a poor man must be allowed some opportunity to enjoy himself sometimes, and if he spends a bit more than he ought to have spent, a lenient view ought to be taken.

(ii) The main sources of credit are the moneylenders and the co-operative banks, traders in cattle and seed grain.

The trader in cattle sells the bullocks at nearly three times the price in this district, which he stipulates to recover in three or four instalments without interest. But before the time of the payment of the last instalment arrives the bullock becomes unserviceable and it is taken back by the trader in lieu of one of the instalments and another bullock is supplied, and so the cultivator remains always indebted to the trader. Similarly, the seed is supplied on the *sawai* system, which means that for each seer borrowed the cultivator has to deliver 1¼ seers at the harvesting time, i.e., 25 per cent. in six months.

(iii) The cultivator is so hopelessly in debt that he never considers it to be a possibility to get rid of his debts once for all. He naturally defers all his purchases till the time of harvesting the crop. As soon as the crop is ready, he first supplies his own wants and when they are supplied there is hardly anything left for repayment.

In a good many cases the crop of the cultivator is attached or distrained before it is ready and in such a case he hardly gets half of what it is worth. He is not allowed to touch it and the bailiff never cares to protect it. The whole system of attachment of crops should be revised so that a better valuation of the crop may be possible. If courts are unable to do this, I would suggest that every crop should be sold as soon as possible after attachment instead of keeping it for a long time in the hands of bailiff. I know of cases in which the whole crop lay in the barn unthreshed and could not be gathered and ultimately the rains washed it off and nobody was held responsible for it.

(*b*) The first measure to be adopted is to increase the cultivator's sources of income. I consider that the system of co-operative banks in Denmark is the ideal for this country, and if co-operative banks were run on these lines, the income of the cultivator would be considerably increased and he would be well off in a very short time. I would suggest that one district or one tahsil should be taken as a unit and the experiment should be tried with all vigour in that tahsil or district.

When the experiment succeeds and all difficulties are overcome, the experiment may be extended. The other method, that I would suggest, is to give the cultivator long term *taccavi* loans. Thirdly, subsidiary industries should be provided in every rural area, so that the cultivators' incomes may be considerably increased and they may be in a position to fall back upon these resources whenever their crops fail. Fourthly, there should be co-operative banks for the redemption of mortgages and legal facilities should be provided for the introduction of such societies. Fifthly, some sort of Loans Act is necessary but no Act will be able to solve the difficulty unless and until the Government makes an attempt to remove illiteracy amongst the masses. What is wanted is to provide facilities for lending money to the cultivator on easy terms and at the proper time. It is not the real amount advanced to the cultivator that he has to pay, but the cultivator is cheated to great extent. This cheating cannot be done away with by any Act of the legislature. Even if Government passes an Act against the validity of contracts of high rate of interest, I am sure the principal will be inflated at the time of advancing the loans and thus the main object will be defeated and the remedy will not be effective. Sixthly, the Famine Fund in every Province should be utilised to provide means to the cultivator by which he can very well fight out his battle with natural calamities.

(*c*) No. In order to save zamindars from running into debt, the Department of the Court of Wards should be better equipped. It should be able to take estates, especially those of women and children, under its management. Even in cases where the income is not more than Rs.1,000 a year, the estates may be put under the charge of Court of Wards and the Court of Wards should make free use of giving these estates further on *theka*

to cultivators or others, so that the charges of realisation and management be very small.

The system adopted by the Court of Wards at present for repaying the loans of the wards is defective. What the Court of Wards does is to fix a maintenance allowance for the proprietor, to charge a certain percentage for management and to utilise the rest of the income for the repayment of loans. The percentage charged for collection and management is rather high, being from 10 to 12 per cent. No improvement is made in the estate. The income is not increased. The object of putting an estate under the charge of Court of Wards ought to be not only economic management but also the improvement of the sources of income. This can be done by placing the estates under the charge of persons who are trained in the management of zamindari property and are experts in reducing the expenditure and increasing the income. I know of no district in the Province where the Court of Wards have made attempts to improve the existing system of agriculture.

QUESTION 7.—FRAGMENTATION OF HOLDINGS.—(*a*) Yes. It was very unfortunate that the United Province Legislative Council did not see its way of enacting necessary changes in the law in connection with the consolidation of holdings at the time of the passage of the Tenancy Bill, though a section was entered in the bill. In the United Provinces there are a number of holdings less than an acre in area. A very experienced officer was put on special duty to suggest means for the consolidation of holdings, but unfortunately no step has so far been taken to give his suggestions a practical shape. On the contrary, provision has been made for the division of holdings in the new Tenancy Act. The section may be very good and conducive to guarding against unscrupulous partners of a holding, but it cuts at the very root of the principle of the consolidation of holdings. The income from farming would be at least 25 per cent. more than what it is now if the area of a tenant's holding was compact. In every partition, some fields are bound to be sub-divided and the number of fields of very small area is constantly on the increase. I would suggest that the revenue law should be so amended that no division of a field should be of less than an acre in area, and if it be found that, on account of this rule, any co-sharer gets less land than he is entitled to, he should be compensated in money. The rule may only be relaxed in the case of small plots adjoining the *abadi* land or if they adjoin other fields of the co-sharer in other *khewats* or *mahals*. It is further necessary that a new bill should be introduced to consolidate small holdings of tenants and the consolidation of *sir* and *khudkasht* land. There ought to be, similarly, a provision for the consolidation of *sir* and *khudkasht* holdings in *bhaiyachara* villages.

(*b*) The main difficulty in the consolidation of holdings is the ownership of different zamindars. This can be overcome if the basis of partition be rental and not the quality of the land. The other obstacles are the tenants themselves. It is idle to consider that it is likely that tenants or zamindars themselves would agree to the consolidation of holdings. The experiment has already been tried in the Punjab and has not been very successful. Unless people are forced by the legislature, nothing can be achieved. The main point of which I am afraid is that the subordinate officers, the *amins* and the *patwaris*, in whose hands the work of partition actually is, would have a weapon in their hands for squeezing out as much money from the petty co-sharers as they possibly could. If Government is keen on introducing this reform, it will have to appoint very reliable people to deal with this matter, and will have to keep a very strict watch over their doings. If Government be willing to do this, it will not be difficult to carry the measure through the legislature.

(*c*) Yes. Minors, widows with life interest and persons legally incapable suffer a great deal on account of want of legislation on the point. Big estates are simply ruined. The Guardians and Wards Act or the

Court of Wards Act do not give sufficient relief in this respect, as the former simply appoints a guardian who seldom troubles to keep proper accounts or to care for minors, and the latter provides for big estates, and there, too, it does not improve the conditions of the estate but simply keeps a strict eye over the realised amount.

QUESTION 8.—IRRIGATION.—(*a*) I consider that the time has come when Government should introduce schemes of irrigation from wells by charging water or occupier's rate just as they are doing in the case of canals. In the whole of the United Provinces, it has been proved that the introduction of tube-wells is a practical proposition and water can be economically lifted for irrigation purposes by this method, but the main difficulty lies in the fact that owners or cultivators cannot afford to sink big sums of money in these installations, and even those who are in a position to have *taccavi* loans from Government are shy of putting in pumping plants, as they are afraid of the mechanic, and do not know the use of machinery themselves. I propose that electricity be generated from all canal falls and a central station be used to work up a number of small tube-wells. There is thus every possibility of protecting the area from drought. The Government may charge for the energy supplied to the cultivator. I would suggest that energy be supplied at a higher rate than it actually costs to Government. The profit should be used in reducing the amount invested in sinking the tube-well and the motor, so that after some time the pump and the tube-well may become the property of the cultivator, and the price of energy supplied can then be reduced.

I have found small 4-inch tube-wells more within the power of the cultivator and the zamindar than the bigger tube-wells.

The Department of Agriculture should encourage such small plants and an attempt be made to reduce the cost of working them. Generally these small plants are worked by kerosene oil-engines. If an efficient and simple crude oil-engine be advocated, I am sure that the cost of working these plants would be considerably reduced.

Another point to which I wish to draw the attention of the Commission is that there is too much centralisation in the Department of Agriculture. If Agricultural Engineers be allowed free scope in quoting the cost of installation and supplying different things necessary to the cultivator, the system would be very popular. The greatest handicap now is that it takes a very long time to decide how much a certain installation would cost, and even then strainers and other articles take a very long time in coming from the department, and till they arrive the whole staff has to sit idle. The whole thing has sometimes to be held over for months and thus the cultivator is very much discouraged.

In the Meerut division, there are a number of very good canal falls and the whole energy is wasted. The cultivators and zamindars know the benefits of good irrigation very well, and they would be perfectly willing to help the Government in any scheme they wanted to launch.

If water facilities were sufficiently increased, all the culturable area would be protected from famine, and then there would be every likelihood of introducing agricultural improvements. It would do a great deal towards avoiding the chances of famine in the country. I propose that the Provincial Famine Fund in all the Provinces be utilised for providing these water facilities. It would be a very legitimate charge on this fund.

(*b*) I am not satisfied with existing methods of distributing canal water to cultivators. The Government has decided to run canal on the off-and-on system. They are alternately closed and opened. In the hot season, especially in the sugar-cane area, fields on account of this system cannot get water for a whole month. Generally the whole crop is parched up during this period. It is only in very fortunate places that a good crop of sugar-cane can be saved from drought in the summer season.

The result is that the cultivator is either forced to use well water where a well exists or to grow only those varieties which are drought resisting and whose yield is naturally very poor. The other defect that becomes rampant in such an area is that a much larger quantity of water has to be applied, so that water may not be required for a long time. The soil, on account of heavy watering, is packed up, the pores of the soil are filled in and the tilth is affected. I have read a number of articles and objections by the educated public and the Canal Department that the cultivator should not apply more water than is required, but the real remedy of giving water at the proper time is never suggested. It seems to be quite necessary that canals should be run continuously just as is done in Punjab and other places, so that the cultivator may be quite sure of getting water when it is required. He will not apply more water than is necessary. At times when there is less water in the river itself, distributaries might be stopped in turn for a week or so. The second objection is that canals are opened very late, and, whenever the rains stop early the crop suffers very badly. Every attempt should be made to arrange for opening the canals just after the stoppage of the rains. The third cause of dissatisfaction is that distributaries are never properly cleaned. The contract is given to big contractors who give it to sub-contractors. They clean distributaries for a few miles in the beginning. When they are convinced that nobody measures the area up to the tail, they leave it in the middle or clear the silt to a very small depth. If supervision of the cleaning be left in the hands of village *panchayats* things might improve, or supervision might be left in charge of very strict officers. The fourth cause of dissatisfaction is that the discharge of distributaries at different places is not rightly reported. Patrols do not do their duty. They measure the discharge rightly at the mouth of a distributary, and they calculate what the discharge at different places should be and report accordingly. When there is a rush for canal water, the channels are cleaned much deeper and the water taken through these channels is much more in volume than it generally is. The result is that outlets beyond a few miles from the distributary suffer considerably. There is no method by which only a certain amount of water can pass through these outlets. If the discharge is rightly given, officers can very well know what should be the proper discharge at the mouth of a certain distributary, and they would naturally arrange accordingly. Cultivators go on petitioning the officers in charge, and their petitions are dismissed without a moment's consideration, on the assumption that the discharges given by the patrol are correct. It is necessary, therefore, that some very reliable officers be put on special duty in those days to check reports of patrols by surprise. Whenever any report is found to be wrong, the patrol concerned should be very severely dealt with. There should also be an arrangement to publish the daily discharge in villages round the places where discharge is reported, so that the villagers may be in a position to know contents of the report. Fifthly, the area over an outlet is much more than it can irrigate. There are causes to which it is due. The first cause is that at the time of settlement the canal authorities are never consulted, and every area which has got water at the time of settlement or a few years before is considerd to be *nahri;* it is so entered in the settlement and Revenue Department. The cultivator naturally demands water for this area, while the canal authorities never include it in their commanded area. The result is that at every settlement the area irrigable by canal is increased without increasing the amount of water in the distributary. The second cause for increasing this area is that everybody wants to take water from the canal. Whenever water is available, the cultivator can irrigate a field which was never irrigated before. If this state of affairs continues a few years,

the cultivator claims a right for canal water and the canal authorities naturally accede to the claim. The third cause is that when canal distributaries were designed, the agriculture was not done on such an intensive basis as is the case to-day and naturally the demand for water has gone much higher.

No methods have so far been employed to prevent the wastage of water by evaporation and by absorption.

At the tail end the cultivator does not suffer on account of the outlet, but he suffers on account of improper cleaning of the distributary and the expenditure of more water at the mouth of the distributary. At present a cultivator can, by digging the channel deeper than it ought to be, make the outlet discharge a larger quantity of water and this is the cause of decreasing the quantity which ought to have reached the tail end. The outlets should be so designed as to make this device ineffective.

QUESTION 9.—SOILS.—(*a*) (i) Yes. The *khadar* land requires special attention. In that area more nutritious grasses should be cultivated, so that grasses might be turned into hay and exported. Afforestation and levelling is also necessary at certain places. In years when there is less rain, this land can be made to yield very heavy crops, provided the question of the keeping of beasts be properly dealt with.

There are only a few places near rivers in Meerut district where good drainage will improve the soil, but proper drainage will considerably improve the health of the people.

(ii) No methodical and scientific attempt has been made to reclaim the *usar* area so far. The alkali problem of India seems to be far easier than the problem of other countries. In some cases, the mere construction of boundary walls would be sufficient to reclaim such areas, because the rain water collected within the boundaries would take the alkali to a sufficiently low level, and the land would begin to yield a good crop after good cultivation. In places where alkali is found in greater quantity, the planting of *kikar* and plum trees has been found to be useful, because the shade of trees prevents alkali from coming up to the surface. There are very big alkali tracts in the Meerut, Muzaffarnagar and Bulandshahr districts. If Government purchase this area from zamindars and try to reclaim it and then sell it over again to zamindars, it will prove a very beneficial undertaking, but perhaps the cost of reclamation might be very high. If a sort of Improvement Trust were created, it might be very useful. The other method that I would suggest for reclamation is to lease out this area to private people or companies for reclamation purposes, with this provision that the lessee would be authorised to use any method of reclamation which he might think proper together with the right of cutting and planting trees. In some instances there is a bed of *kankar* below the alkali crust, and it would be possible to reclaim by digging out the *kankar*. Also, at some places, scraping of alkaline earth will have to be done and trees planted at different places.

(iii) The prevention of the erosion of the surface soil by flood water is possible by planting trees in rows at different places and also by putting proper small *bunds* at different places. The height of the *bunds* should be gradually increased, so that water may not cut them down and so that silt may be easily deposited. If properly worked up, areas which are being washed every year by water can be very easily protected and the cost of protection will be very well paid from the trees planted. This will not be possible unless the work is done systematically and in right earnest. It seems beyond the power of ordinary zamindars to do it, unless there is a class of workers who understand these things and who are willing to work up the schemes.

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(*b*) (ii) In village Nan, pargana Hapur, Meerut district, there run brooklets carrying ordinary rain water, with very broad *patris* on both banks. Zamindars, to whom these patris belonged, gave this land for cultivation. The result was that the *patris* were turned into fields and the condition of the place changed. The result after a few years was that the area all round was washed off by the rains. Thus a very large area of culturable land was turned into waste land.

(*c*) The Government should give sufficient encouragement to those who want to improve these lands by giving financial help and expert advice. The revenue on these lands should be remitted for a number of years so that the persons reclaiming them might be able to recover the cost of reclamation. Such lands belonging to the Government or to the Court of Wards should be given on lease for reclamation. For ten years no rent should be taken, and after that the amount of rent should be commensurate to the income derived from this area.

QUESTION 10.—FERTILISERS.—(*a*) Yes, provided facilities be increased. No fertiliser is of any value in a place where water facilities are not available. Where water facilities are available, people should be encouraged to use fertilisers. The manure to which the Government's attention should be drawn immediately is bone manure. Bones are being exported every day and the Indian soil is suffering loss in phosphates. I would suggest that the export of bones should be prohibited by law. Small factories in every district should be put up to prepare bone meal. The Government should purchase large quantities of bone meal from these factories and distribute it in cities and villages for valuable crops like sugar-cane and potatoes. Distribution should be restricted to a small area only, in the beginning. When people are convinced of the utility of this manure, steps should be taken to extend the field of activities to other places. Green manure is the second thing to which attention should be paid. In order that this manure might be used on an extensive scale, it would be necessary to reduce the canal rates on these crops.

As to scientific or artificial manures, the first thing to which attention should be given is potassium nitrate. Sufficient areas are available in every district of the Province which are rich in this substance and it would not be difficult to collect it for manuring purposes at small cost. It is also possible to increase its supply by artificial means by cultivating the bacteria which turn common earth into potassium nitrate.

There is a very good field for *nim* cake to be used as manure. I have found no better remedy for white ants than the use of this manure. If, for two or three years, the Government were to purchase *nim* cake in very large quantities and distribute it amongst the cultivators of sugar-cane at cheap rates, I am sure an incentive would be created to manufacture *nim* cake. *Nim* fruit generally goes to waste and only a small quantity is collected now. I cannot recommend sodium nitrate as a manure inasmuch as it will increase the amount of sodium in the soil and ultimately would do more harm than good.

Sulphate of ammonia may have a very good chance of success provided it is available at a sufficiently low price. The Government can help the industry by lowering freight charges for sulphate of ammonia and by devising means to manufacture sulphuric acid at a low cost, so that the cost price of ammonia may be brought down.

Artificial manures for ordinary crops cannot be used by the Indian farmer, because in the first instance they are rather dear and, secondly, he has not the requisite technical knowledge to use them with profit.

(*b*) The prevention of fraudulent adulteration of fertilisers is possible by making the adulteration a penal offence and by appointing Inspectors to see that fertilisers sold contain the percentage of the different ingredients as advertised.

(*c*) The best method of popularising any new manure is to distribute the manure freely in a locality and supervise its use for a number of years. The field of activity should be restricted till people are convinced of the utility of the new manure. When people of a certain locality are fully convinced of the utility of a certain manure, the practice will spread very soon in the vicinity. But, before advocating a new fertiliser, it would be necessary to thoroughly study its effects on the texture and the physical properties of the soil. The Indian cultivator has survived so long in spite of his ignorance and illiteracy simply because he has taken pretty good care to keep his soil in the proper physical condition.

(*d*) There has recently been an increase in the use of oil-cake manures in the Province. The price of oil-cake on account of its demand for manurial purpose has gone up considerably, and people are prepared to offer the same price for even those kinds of cakes which are not used for feeding cattle as for the kinds of cakes used for the latter purpose.

The use of bone meal is coming to the front for potato growing, and if the bone meal be properly handled and properly advertised it will find a ready sale after a few years.

(*e*) No. The spasmodic attempts at applying a small quantity of these manures at the farms do not serve a useful purpose. A scientific study of the soil and manures is necessary. Not only should the question of yield be the deciding factor in the investigation of artificial manures, but the texture of the soil and the chemical effect on the physical condition of the soil, and also the physical properties ingrained in the produce, should be investigated. I am a believer in the idea that by a difference in cultivation and manuring, the quality of the produce is affected, and it also affects on the human frame. The Hindu *sastras* go still further; they believe in the effect of the difference in the quality of manures on the mental condition of the people.

(*f*) There is only one method by which you can discourage the practice of using cow-dung cakes as fuel, and it is by providing some cheap fuel to the cultivator. Unless this is done, there is no possibility of dissuading the people from using it as fuel. As I have suggested elsewhere, we should make necessary amendments in the law of the Province, by which tenants may also be allowed to grow and cut trees on their holdings. It is also necessary that every waste land should be utilised for growing fuel trees.

QUESTION 11.—CROPS.—(*a*) (i) An improvement of existing crops cannot be made by resorting to new varieties of seeds. The introduction of new varieties might have been of some use provided the Government experts had been fair in advertising their merits and demerits, but as long as every new seed has to be praised and no demerits are disclosed, the case seems to be hopeless. The cultivator should always be given to understand in what fields and under what circumstances a new variety will succeed.

I have more faith in improving the crops by seed selection on the right lines rather than taking to new seeds obtained by breeding. The cultivator has forgotten how to do seed selection in his field, and no attempt has been made to teach him the lines and the principles on which he should do it. There is a number of varieties of local seeds grown in every locality and they have developed natural potentialities for that climate and soil. It is not a wise step to discard those varieties altogether. For example, Muzaffarnagar wheat is very well known throughout the country, and I know of a time when it was purchased by the department for seed purposes. No attempt during those days or now has been made to improve that seed by selection. It has been condemned without making an attempt to improve it. Other instances of other varieties of seeds can also be quoted. Besides this, no investigation as to which root system is adopted to the soil of a particular locality seems to have been made, and new varieties are recom-

mended without taking into consideration the adaptability of their root systems to the soil concerned.

The cultivator has no information as to which variety is in demand in the market. If the market requires a certain variety, the cultivator should be apprised of that fact. Whenever Government experts decide that a certain variety is needed for the market, they should also arrange for the purchase of this produce at an attractive price from the cultivator. Nobody is attracted by the idea of growing a new crop unless he thinks that it will be sold at a somewhat higher price than he is getting from the ordinary variety.

(ii) I have already touched upon the question of introduction of new varieties above. Sorghum and lucerne crops give the highest yield and the cultivators are thoroughly satisfied with them. No new fodder crop should be introduced unless and until the department is thoroughly convinced that it would give a better yield than the above at the same cost and at the same amount of labour, and that it would agree with the soil and other conditions as the above crops.

(iii) The present method of keeping seed stores by the Government and selling seeds to the cultivator is very costly. Even if the Government decide that seed stores are to be opened by them in different localities, I consider it necessary that seed stores should be handed over for management to private people. The cost of management under the Government will naturally be very high and, besides, the cultivator will not have the same facilities for purchasing as he would have under private management. I propose that whatever seeds the Government want to distribute should be left with a private person or a private company with the guarantee that the pure seed, as supplied by Government, will be supplied to the cultivator at the rates prescribed by the Government. The seed distributor may also be authorised to sell his own seed to the cultivator along with the Government seed provided that it is of the required standard. If this method is resorted to, the result would be that a number of private persons will be interested in the sale of seeds and people will be trained in this business. The cultivator will be able to have seed on credit whenever he cannot afford to pay in cash.

Distribution through the Government stores is not enough. Propaganda should go on and the cultivator should be taught the method of selecting and keeping his own seed. The agency of people who carry on the business of supplying seed should also be utilised.

In order to popularise a new variety, the Government should distribute seed freely to big cultivators so that they may be convinced of the utility of that variety, and if they are satisfied they will naturally take up the cause of that variety.

QUESTION 12.—CULTIVATION.—(i) The existing system of tillage can be very much improved by providiing means for dry cultivation. In the months of March to June, the land remains fallow and uncultivated and the same is the case of land in which a *rabi* crop is not grown in the winter season. If the fields be ploughed up in these days, the weather will have a sufficient effect on the soil and its productive power will be very much increased. In order to do this, light disc ploughs should be employed.

Fields are not well prepared for the *rabi* crops when the rains stop early. The wooden roller employed to crush the clods is very inefficient. The use of cultipackers and Glasgow rollers should be adopted. The present length of these machines does not afford sufficient room for four bullocks to draw them. This defect can, however, be easily removed and should be removed.

For the preparation of fields for the *rabi* crop and for sugar-cane, I would recommend the use of iron ploughs which go about 6 inches deep to supplement the Indian plough. But they should only be used in fields at a time

when they are free from weeds especially of the *dub* grass. The Hindustan plough and plough No. 12 are especially useful in this respect.

(ii) As far as *kharif* crops are concerned, we should not try to introduce any new mixtures. The *kharif* crop is a very uncertain crop in the Province, and therefore the cultivator has to use at least two different crops mixed together in a field so that, if one is affected by excess rain or the want of rain, the other may perhaps survive. The system is very economical. In places where cotton is the main crop, I do not like the idea of putting in other crops along with it. Only *bindi* should be grown in a few rows in a field, as it gives vegetables to the cultivator and also provides him with a good defecant for sugar-cane juice. The plant is also necessary in a cotton field, as insects which would have affected adversely, the cotton plant would attack the *bindi* plant first and thus it wards off the injurious insects from the plant. When the harvest of cotton is practically over, we can put in *maithi* or chillies in the cotton field, or we may grow some catch crop for green manure. As to the rotation of different crops in the Meerut division, the best rotation found useful is as follows: Sugar-cano first year, wheat second year, *juar* third year and gram or peas fourth year, and this has been found by experience to be the best for sugar-cane. For a three years rotation I would suggest sugar-cane first year, wheat second year and *savi uid* or *neel* (indigo) third year. For a two years rotation for sugar-cane, I would suggest sugar-cane, vegetables, *kharbuza*, *kakri*, etc., and *sann* or indigo for green manure.

QUESTION 13.—CROP PROTECTION, INTERNAL AND EXTERNAL.—(i) In this Province there seems to be no arrangement worth the name for protection of crops from infection, pests and diseases. It is however fortunate that this danger is not widespread. But it is feared that the introduction of new varieties of seeds and seed-canes will bring in its train new pests and diseases and some preventive or curative methods and medicines will have to be devised. The history of new plants should be available for the public and they should be warned beforehand to what diseases the new variety is liable and what are the true remedies for them. An investigation into the existing diseases and pests is also necessary. The most important question is to avoid the injurious effect of white ants. So far no remedy has been found to be effective. The methods suggested by the department have not been found to be useful. In new sugar-cane varieties such as S.39 and S.48, the plants dry up themselves before the harvesting season and after the rains. Thus the whole field is affected. Similarly, the Coimbatore varieties of canes are exhibiting new diseases and their leaves are affected in different ways.

(ii) No internal measures seem necessaray so far as the old crops are concerned, as they have become thoroughly acclimatised and are immune to ordinary pests, but for new varieties, as suggested above, some internal measures against infection would be necessary.

QUESTION 14.—IMPLEMENTS.—(*a*) The introduction of lifts worked by bullocks or by mechanical power is quite essential for canal channels. In places where lift area is very high, the canal channels cannot be utilised in the night time as labour at night is not generally available. No device for lifting water from wells has yet been devised which could replace the Indian system of lifting water by *charas*. Pumps and water lifts can be used for lifting water from wells which have got a sufficient quantity of water but the cost of the plant and of its working is so high that it is beyond the means of the Indian cultivator.

The introduction of power crushing machines for sugar-cane is a great desideratum as the introduction of these mills will give much needed relief to bullocks and their power will remain in reserve for ploughing in the winter season. Ploughs and cultivators should be introduced but before

their introduction it is necessary to study very well the conditions of the soil and other circumstances. The introduction of a disc plough would be useful for fallow land and also for ploughing in the green manure.

Chaff-cutters worked by hand or by bullocks should be introduced as labour-saving machines.

(*b*) Convince the cultivator of the utility of the improved implements and bring down their prices so that they may be within the easy reach of the cultivator; then no other inducement will be necessary for making him adopt the improved implements. The department should give free scope for competition among the manufacturers of implements and should not bestow its favour on particular manufacturers. But Indian manufacturerers should be encouraged. Costly machines and implements should be given to the cultivator on hire by the department, or they should be supplied to the cultivators through co-operative banks or by the hire purchase system.

(c) Yes. Freight charges are the first difficulty. Insurance at higher rates by the railway is another handicap. The want of scope for fair competition amongst manufacturers is another difficulty.

I would suggest that the Railway Board be asked to provide for cheap freight charges and the Government should introduce a cheap system of insurance for implements. Manufacturers should be given a fair chance of competition amongst themselves. The Government should ask for tenders from all manufacturers (Indian or foreign) for a machine of a certain design and should purchase machines or implements ordinarily from the firms which give the lowest tenders. This should specially be the case for those implements or machines which are designed by the department.

QUESTION 15.—VETERINARY.—(*a*) The control should be under the Director of Agriculture. The department is not so fully developed as to require a costly arrangement of creating a new department.

(*b*) (i) Yes. The system works well but it would work better if the Veterinary Sub-assistant Surgeons were entirely under the control of the Board and not under that of the Veterinary Department as they are at present.

(ii) Expansion is highly necessary. Dispensaries are not of much use to the village people as poor cultivators cannot take their cattle to the hospital nor can they keep them at the hospital; every day bringing and taking them away is a great strain on a diseased animal. I would suggest that for ordinary diseases there should be ready-made medicines available, with directions to be freely distributed amongst the villagers. A free distribution of such medicines will be highly useful.

(ii) All incumbents of the department should be provincial but Sub-Assistant Surgeons should be under the control of District Boards as I have already suggested above.

(*c*) (i) No. If hospitals be under the full control of District Boards the village people will fully avail themselves of them. There should be special rules for Sub-Assistant Surgeons to attend the diseased cattle in the villages.

(ii) Touring dispensaries are of no good. They should be stopped. It is only in the case of contagious diseases that touring dispensaries can be of any use.

(*d*) The illiteracy of people is the greatest handicap in creating confidence in the doctor. I do not consider any legislation is necessary. If people are forced to adopt a certain measure, I am afraid that subordinates will make money out of it. Education is the best thing to popularise the system advocated. If big zamindars and cultivators be convinced and they take up to a certain system of treating a certain disease, then naturally other cultivators will be willing to follow them.

(*e*) Yes. Sometimes the serum is not available. I have myself once experienced this difficulty, when I was the Chairman of the District Board. With great difficulty people were prevailed upon to have their cattle inoculated, but, unfortunately, the serum could not be received in time.

(*f*) No fee is charged. The only obstacle is that the cultivator is very poor and he is afraid that if inoculation affects his cattle adversely he will be ruined.

(*g*) No; not until the time when the villager makes good use of the existing facilities.

(*h*) (i) Not at this stage. Even if it is decided to conduct the investigation I would suggest that the investigation should be made by provincial authorities. If a specialist is required, a temporary man might be employed under the control of Provincial Director. The Director or any expert might be put on special duty.

(ii) No.

QUESTION 16.—ANIMAL HUSBANDRY.—(*a*) (i) The question of improving the breeds of live stock is not easy. No particular breed can be expected to thrive throughout the Provinces, which contain areas widely differing in climate and the rations available. What seems to me to be possible under the present circumstances is that systematic efforts should be made to improve the existing breeds rather than to import new breeds. This can be done by selecting the very best bulls from amongst the existing calves for procreation purposes and mating them with the best cows available and by preventing bulls of inferior type from covering the cows. Good cows are not at all available in this Province.

(ii) The well-known Kosy breed is practically extinct. The imported cows from Hissar and Rohatak do not thrive and they generally fail to give sufficient milk during their next lactation period. There is no likelihood of any improvement unless the question of breed is properly investigated. The dairyman gets practically his whole supply of milk from buffaloes.

To my mind there is something wrong with the ration given to the cows. If proper investigation were made on this point, the difficulty might be overcome.

The main defect in the present system of dairying is that calves are starved altogether and there is no system of providing the calf with better nutritive food. The second defect is that cows and buffaloes remain in milk for a very short period and during the time they are dry proper care is not taken in regard to their feeding and housing. The dairyman is so poor that he cannot afford to look after the animal properly when it is dry. An attempt should be made to increase the lactation period of the milch cow and to suggest cheap rations for the period when the cattle is dry.

I would suggest that good cows and buffaloes of the best breeds should be distributed amongst the cultivators and their price should be realised by instalments. The cultivator should be given instructions as to the upkeep of these animals.

(iii) The existing practice can be improved by (1) arrangement for better housing of the cattle in the cities, (2) distributing good cows, buffaloes and bulls amongst the cultivators, (3) investigating the best and the cheapest rations for the cattle, (4) providing facilities for the sale of milk and its products, (5) enacting penal laws against the adulteration of milk and butter so that the dairyman may get a proper price for the genuine article, (6) stopping the importation of substitutes for *ghi* and prohibiting the name of *ghi* being used in any form in their advertisements.

(*b*) (1) (ii) There are no pastures besides the *khadar* area in this district. It is practically the same all over the Province, where almost the whole area is taken up by cultivation. It does not seem to be economical to

convert culturable land into pastures. There is a possibility of making people interested in growing fruit and timber trees in places where fruit and timber growing is profitable and using the land under the trees as pasture. Besides this the *khadar* area can be made to grow better grass, or can be used for pasture. Generally the Ganges *khadar* land is not producing good fodder grasses, and a special investigation is necessary in this respect. Absence of enclosed pastures does not, in my opinion, cause injury to cattle in this district.

(iii) The deficiency can be made good by importing such fodder from areas where it is abundant, but this can only be possible if the railway freight rates are reduced and communication facilities are provided.

(iv) In the dry season it is only the lucerne grass that can be available, but it requires profuse watering before it can give a sufficient number of cuttings. *Moth* and *mung* are other crops that are cultivated in places where canal water is available. If, in such areas, the water rates for green fodder were reduced, people would put more area under these crops and the difficulty would be appreciably reduced. In other places green fodder can be available only when water facilities are provided.

(v) No scientific investigation has been made by which it can be pronounced that any particular mineral constituent is necessary for supplementing the existing fodder and foodstuffs. Generally, only salt is at times given to the animal, and that had been found sufficient to keep the animal hale and hearty.

(*c*) Generally the fodder scarcity occurs in the months of November, December and January, especially when the *kharif* crop fails.

(*d*) (i) By introducing good varieties of grasses in the *khadar* areas.
(2) By finding out new fodder crops for growing in the hot season.
(3) By investigating the chances of silo fodder.

(*e*) Landowners can take a keen interest only when they are given practical demonstration. Pamphlets and leaflets are distributed amongst them in the vernaculars of the Province.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—(*a*) A good cultivator in the Meerut district works for all the twelve months, except on rainy days. Of course the women folk have sufficient leisure. In places where land is not protected by water facilities, the cultivator has to remain idle for about four months in the year. He does nothing in those days except gossiping.

(*b*) The first thing necessary for the encouragement of the adoption of subsidiary industries is the arrangement for the sale of articles manufactured by the people and the introduction of model factories by the Government. There are a number of industries that can be suggested. The introduction of a new industry will depend mostly on the local conditions of the place. I would suggest fruit growing, vegetable growing, and fruit and vegetable canning, manufacture of jams and jellies, etc., and vinegar manufacture, starch making, casein manufacture, as subsidiary agricultural industries. Oil-pressing, spinning, weaving and mat-making, and hosiery are other industries that can also be very easily introduced amongst the cultivators.

(*c*) Bee-keeping has never been tried on scientific lines. Even in Government schools and colleges it has not been tried. Poultry rearing is not liked by Hindus on religious grounds.

Fruit-growing.—People have only recently begun to take an interest in this industry as a business proposition. So far it has been considered to be a sin to charge for fruit taken from a tree, and even now in the eastern districts nobody will charge for the fruit taken from a tree growing in his field. People are now learning that fruit growing is a paying proposition and are slowly taking to it. In villages where the soil is mostly

sandy fruit growing is very profitable and people should be induced to adopt it. *Siri, pessi* and lac culture is against the religious ideas of the Hindus and they are not taken up in this Province on business lines.

Rope and basket-making.—I do not consider there is much profit in either of these industries and whether there is a demand for them in the country and the cultivators consider it below their dignity to take to these industries.

(*d*) As far as this Province goes, the Government has done very little to help these industries. Oil-pressing is a very paying job and the Government should introduce small machines that can be worked in a village to replace the antiquated wooden mill now in use. I am not in favour of big machines being introduced at central places. Oil-cakes received from these central machines have very little food value.

Sugar making.—The industry is going to ruin day by day and no serious attempt has so far been made to improve it. The Sugar Commission Report was awaited with impatience by the public but no practical result has come out of it as yet, nor is there any likelihood that any practical step will be taken in the near future. Competition is becoming harder and harder every day and a serious attempt to save the industry both by the Government and the people is necessary. I am not one of those who consider that India is out of the sugar-cane zone and that it is not a practical proposition to save the industry. I rather believe that India is very well suited for this industry. A country which matures cane in nine months only, and where the tonnage of cane and the contents of sucrose is sufficiently large can, by proper arrangement and by providing better facilities for manure and irrigation, very well compete with the best equipped and the greatest sugar producing country in the world. Sugar-cane growing is going on mostly on account of *gur* manufacture. If the Government is really keen to improve this industry, the introduction of new Coimbatore varieties will not be its solution, unless provision is made for better irrigation and manure facilities, and unless countervailing duties are imposed on imported sugar.

Cotton ginning.—The news that America has been able to under-sell Indian cotton to Indian mills and is exporting cotton to this country is very appalling. If foreign countries can compete with us in selling cheap agricultural produce, then there seems to be no likelihood of economic regeneration for this country. If cotton growing had been taken up in right earnest and, instead of introducing new seed from outside, Indian seed has been developed and improved and better facilities for cotton growing had been provided, things would have been otherwise. There is no demand created for using cotton seed for felt, oil and fuel. In ginning there is the obstacle of sending it from place to place. The artificial barrier of prohibiting the growing of indigenous varieties in certain localities is not the proper solution of the cotton industry, unless the cultivator is convinced that the new variety will give him more yield than the indigenous one.

As to rice hulling, utilisation of wheat straw for cardboard, utilisation of cotton seed for felt, fodder, oil and fuel, utilisation of rice straw for paper, etc., nothing has been done by the Government. The Government should try to decide in what way they can help the people in the improvement of these industries.

(*e*) There seems to be no possibility of introducing subsidiary industries on the factory system for the time when the agricultural labour has to work at fields.

(*f*) Yes. The only thing that the Government has done so far is the survey of different industries in the Province and after that no practical steps have been taken to improve or encourage them. The survey does

not deal with the technical difficulties of different industries. I consider that before Government takes any step for the improvement of these industries it is necessary that they should be taken up one by one and organised on a commercial basis. The haphazard system followed at present of advancing loans and grants to particular concerns has not been productive of good. In my opinion, much attention should be paid to the encouragement and improvement of the existing industries by bringing home the existing defects in the method of manufacture to the manufacturers, by giving technical knowledge and by supplying information about the market and the purchase of raw materials, etc. New industries might also be introduced, provided they do not require much of technical knowledge and the outlay of large capital. The Department of Industries should be better organised and financed and people who really take interest in Indian industries and who know something of the business should be employed. New graduates or men of no experience should not be put on to this work. There is no dearth of well-qualified Indians with foreign education in the country who can be employed with advantage in the department.

(*g*) A number of medicinal herbs were successfully cultivated during War time when medicinal articles were not available. As soon as the War ended, the cultivation was given up and the information and experience gathered was not utilised. By their introduction people will be employed in producing these herbs. If better facilities for learning different industries in schools and colleges were provided new industries might be started and might employ the rural population.

(*h*) It is idle to expect that village people will work in an honorary capacity. There ought to be a well-thought out plan for improving the health conditions of a given area and the plan should be worked out through the officers of the District Board. In this plan special attention should be given to the methods of storing manure and drainage. The scheme should be given a practical shape at a time when the agricultural labour is free.

QUESTION 18.—AGRICULTURAL LABOUR.—(*a*) (i) Migration is possible only for a short period and therefore travelling facilities and accommodation should be provided. Permanent migration seems to be against the sentiments of the people of this Province.

(ii) The land may be acquired by the Government and given on long leases to the people who want to cultivate it at a reasonable rent, providing facilities for irrigation. Where areas are uncultivated on account of bad climate, steps should be taken to improve the health condition of those places. Better facilities of communication should also be provided. Labour is scarce at different places and it is due mainly to these factors.

(*b*) (1) High caste people do not like the idea of taking to the plough themselves and they are using labour where they were doing things themselves previously. People who have got something of education feel a sort of distaste for manual labour and naturally there comes a shortage of labour. (2) Labourers do not put in the same amount of work as they were doing formerly. The idea of responsibility is gradually disappearing amongst labourers. (3) The number of agricultural labourers has been reduced by the ravages of plague, influenza and malaria. (4) In villages which are situated near important cities, labourers migrate because they get more wages than the farmer can afford to pay. The first remedy I would suggest is that the zamindars should be made to realise the dignity of labour and should be induced to work themselves in the fields instead of leaving everything to be done by hired labour. Labour-saving machinery should be introduced.

(*c*) There are some places, in the eastern districts only, where uncultivated land is available. There the communications and health conditions have to be improved before any attempt can be successfully made to bring those lands under cultivation. The question of drafting surplus labour to such

areas is not easy of solution. Much will depend on the prospects offered to the labourers and on the rates of the grain and other commodities prevailing there. The main problem to my mind in agricultural labour is that the Indian labourer, since the time when he has come more in touch with city life, does not feel the same sense of responsibility as he used to. Ten years ago, a labourer could be left alone in the field for days and days together and he would carry out every operation as if it were his own field. But now, if one labourer is employed, another man is necessary to watch his movements and to take work from him. To my mind this seems to be the greatest drawback with regard to agricultural labour. The sense of responsibility should be developed in the labourers before we can think of any agricultural improvement. The question of high wages does not seem to solve the problem. Even at places where wages have considerably increased, the sense of responsibility is not developed. In India, if a labourer is employed on the contract system the work will be very badly finished and if employed on daily payment very little work will be done by him. Things were not so bad before as now. I consider it to be a national loss of the worst type and a remedy to remove this evil ought to be found, specially in places where the labour is scarce and agriculture is done on intensive lines.

QUESTION 19.—FORESTS.—(*a*) No. Generally, in forests, good grasses do not grow and consequently milch cattle do not thrive in such places. No attempt has been made to make enquiry and experiments in order to find out the grasses which could successfully be grown in forest areas. If they could be used for growing such grasses and proper facilities were given to the neighbouring villages for grazing cattle and cutting grass, a great impetus to dairy-farming and other agricultural pursuits could be easily given.

(*b*) There are only two ways of supplying firewood and fodder in rural areas, first by growing them in those areas and, secondly, by importing them from outside. As regards the first, places which are *bunjar* or *kallar* should be utilised for growing trees. The law as to the cutting of trees by the tenants should be changed. The law as it exists does not allow the tenants or the zamindar to cut trees from the occupancy or ex-proprietary area. The tree, according to law, belongs to the zamindar but he is not allowed to cut it. All trees that may be self-grown belong to the zamindar, and therefore the tenants try to uproot every tree that grows, as it affects the crops on the fields, and when it has grown he never cares to rear it properly. I consider that the time has come when the law should be changed and self-grown trees should belong to the tenant. He should be encouraged to grow fuel and timber trees in his fields, but it should not be considered as an improvement, so that whenever the tenant is ejected he should get nothing for the growing trees. The only precaution that seems to be necessary is that fields should not be allowed to be turned into groves.

All village tracks and *katcha* roads should be planted on both sides with trees and every person who plants those trees should be allowed to cut them, provided he plants new trees in their place.

Common land grown with fuel and timber trees should be treated as severalty in partition proceedings, so that co-sharers may be able to grow trees on the common land where they are not doing so on account of the uncertainty as to who will be the owner of those trees. As regards the second remedy, I would suggest that better roads should be made and the railway freights be reduced. The absence of good roads and the high freight charges combine to make the import of fuel and fodder very costly.

(*c*) Yes. Trees are the best safeguard in saving the land from flood and erosion. If schemes of afforestation be adopted, a good many places which are gullied all round will be silted up in a short time, and then they could

be used for agricultural purposes. The erection of small *bunds* will also prevent erosion and damage by floods.

(*e*) Yes, in the *khadar* area, and near small rivers and brooklets.

(*f*) No.

QUESTION 20.—MARKETING.—(*a*) No. The criticism that I give below applies to the whole country generally and to the markets of the Province specially. Indian agricultural produce is notorious in the foreign countries on account of adulteration and mixing up of different grades. Sometimes adulteration is done with grades which spoil the quality of the original article. The whole blame is placed at the door of the cultivator, but I consider that he is not to blame. I would admit that the cultivator does not grade his produce properly before he sends it to the market, not because he does not know the benefit derived from grading, but because he is not paid sufficiently for the trouble involved. There are no markets in which a good article is in demand. The producer of a graded good article is always at a loss when he sends it to the market. Therefore, naturally, grading is avoided. If reliable markets are created by co-operative societies, as in America, and if the foreign market be ready to pay higher prices for graded articles, the cultivator will gladly take to it. As far as adulteration goes, he is not at all responsible for it. I have seen people in the market before they export commodities to other places putting in sand, earth and every other article that they can easily use for increasing the weight of the produce. They do it because even an article without sand, &c., has to pay *karda* charges and, even where these charges are not levied, articles containing sand, &c., are sold for a much higher value than they would have fetched if they had not contained any such adulterants. Where only sand, &c., are mixed up with the grain, it is possible to clean them; but there are other devices for wetting the grains which make them bulky and at the same time injure the quality. In the case of cotton, wetting is generally resorted to either in the market by the market people themselves, or by the dealers who purchase it from the villages and bring it to the market. This practice affects, very adversely, the staple of the cotton and makes it much weaker.

The question of producing different varieties in a field and sending them to the market separately seems to be impossible, considering the market conditions of the country. Any separate variety will not fetch a bigger price than several varieties mixed up together. It therefore becomes necessary for the cultivator to collect all sorts of different varieties of one crop into his barn and send it to the market, but if the cultivator gets a better price for different varieties graded separately, he will naturally keep them separate.

I would suggest that wetting, or in any way deteriorating the produce by methods which affect the quality of the produce, be made penal and deterrent punishments may be inflicted on those who still persist in adopting those means. Co-operative banks, which are now doing the work only of banking, should be used for purchasing and selling articles; if there is a network of such societies which take upon themselves the payment of good prices to the cultivator and of sending the unadulterated articles to foreign countries, the reputation will at once be established; but the work requires a great deal of trouble and a number of reliable men who will organise such societies. If the Government or private companies keep themselves well informed of the market conditions of foreign countries, it is likely that the cultivator might be induced to produce those varieties which are much in demand. I am against the idea of artificially forcing the cultivator not to produce certain varieties. It is uneconomical from his point of view. For instance, if a cultivator is forced to grow Egyptian or American cotton in this Province he will suffer a great deal. No doubt a small quantity of good cotton will be available at the sacrifice of the poor

man's labour. Artificial methods like this should be avoided as far as possible.

(*b*) The existing system of marketing and distribution is not satisfactory, as I have already said in reply to part (*a*) of this question. The procedure of sending the produce to the market is as follows:—

The cultivator, as soon as the crop is harvested, brings it to the market and places it at the shop of a dealer for sale. In some cases an intermediary purchaser purchases direct from the farmer and takes it to the market after adulterating it.

All such produce purchased from different people is mixed up together and adulterated with other articles in order to increase the weight and then it is sent out for export. If it is required to be sold for local consumption, it is not generally adulterated, but the dealer makes his profit by short weighment. I know there are a number of shops in every Indian market which purchase articles, say, wheat, for example, at Rs.8 a maund. They sell it at the same rate to the local consumer and make money out of it. They purchase, in the morning, wheat worth Rs.50 and make a few rupees by giving short weight and selling at the same rate at which they purchased. The article, when it is to be stored for some time, is stored in a very bad manner, which affects the quality of the article itself. Articles which are to be stored for long are stored from money advanced from banks and these *khattis* are kept as securities. Then one *khatti* passes from hand to hand by the wagering contract. Several devices are adopted in order to evade the law on the point. 90 per cent. of the cases which are brought into the civil courts for money on these contracts are of this nature. The markets are full of gambling devices and educated people are more to be blamed on this score. They provide facilities and invent devices for evading the law on the point. The creation of several new chambers in big cities is nothing else but a device for evading law on this point. The High Court rulings are very much responsible for these devices too. If the Government is really keen on stopping gambling in the markets it should put these practices down with a strong hand. In the Indian market people are not at all interested in the proper handling of commodities that come to them; they are more interested in gambling. There seems to be no possibility of improvement of any kind through these people unless they are forced to adopt honest means to earn their living. Financing is generally done by banks or by companies which purchase agricultural produce in advance.

I do not believe that there is any possibility of improving present Indian markets unless drastic steps are taken by the Government as indicated above. I like the idea of selling these articles through co-operative societies. If there be some central market in every district where from the produce can be exported to foreign countries or to the consumer, there is likelihood of improving the method. I would suggest that these co-operative societies should have no concern with banking. The system should be like this: Whenever an article is brought to the market three-fourths of the price should be given to the seller and he should be given a score-card stating the quality of the article. The entire produce got from different sellers should be graded separately and stored properly. When the market goes high, the stock should be sold. The profit so made should first go to defray the expenditure involved and then the balance of profit should be distributed amongst the cultivators, along with the price of one-fourth which has been withheld at the beginning. The percentage of amount withheld as security for risk should be further reduced; it would afford a greater inducement to the cultivator to send his produce to co-operative societies. Of course in the beginning for some two or three years, the market people would try to undersell these societies but if the Government persists and the right sort of people are employed, I am sure the whole scheme would be a success. In order to direct experiment, the Government should centralise its activities

at a few places in the country and should set apart a decent sum for meeting the expenditure.

(*d*) Yes, so far there has been no attempt to supply any information to the cultivator. All reports, if any, are published in a foreign language and they are never prepared for the purpose of the cultivator; they are prepared for the purposes of political statistics. The Government should start a bureau and a weekly paper to give all this information in the vernaculars of the different Provinces. The price of this paper should be very low so that it may be within the reach of every cultivator and the bureau should give all information without payment.

QUESTION 22.—CO-OPERATION.—(*a*) I consider that the co-operative movement is not making any headway amongst the people and if it continues to be conducted on the lines on which it is now being conducted in this Province, it is bound to fail. I am not in favour of credit societies at all. No credit society can advance enough to the cultivator to satisfy his needs, and naturally he loses faith after a very short time in these societies. When a society is formed members are enthusiastic about it, but, as time goes on and there is a bad season, they are unable to give back their instalments, new advances are stopped and they lose every faith in the credit societies. By creating these societies the Government has taken upon themselves a task which they can never perform. Nobody can compete in this respect with the moneylender, it is idle to try to. The cultivator would recognise the attempt much better if steps were taken to increase his profit and to decrease his expenses. I am in favour of co-operative societies which will look after all his needs and, instead of giving him money on credit, will give him seed, bullocks, machines, agricultural implements and everything he needs, and find out his needs and try to supply him with all these articles at very cheap rates. They should also try to sell his produce at the highest price. To my mind this seems to be a possibility. If Denmark could put the entire dairy industry on a sound basis on these lines, why cannot the poor agricultural country of India do the same? There are honest and reliable persons but honesty and reliability are not the only things which make a department successful. Knowledge is the first thing that is required. The Government should send a number of people outside the country to those places where agricultural co-operation is in full swing, especially Germany and Denmark, and put them in charge of the co-operative movement; then things would greatly improve. Non-officials are not interested generally in the actual co-operation, because under the present system they can do very little to help the cultivator.

The law should be so amended as to include societies of the type indicated above. Then and then only non-officials will be made to take more interest in the thing and people generally will come to like these societies.

(*b*) I am not in favour of different societies formed for different purposes. There should be only one society which will do any business out of the list mentioned in this question.

(*c*) Yes, legislation will be necessary for compelling the small minority to join any useful schemes, but before any step besides the consolidation of holdings is taken up, it seems necessary that a public opinion be created amongst cultivators before legislation is enacted.

(*d*) No. I can speak of the Central Bank of Bhatiana and the District Bank of Meerut. Members of societies of both these banks do not know what is meant by co-operation and they have never taken a keen interest in its success. In the Bhatiana bank, which is the older bank, a number of societies have already gone into liquidation and others must follow. The District Bank, Meerut, is in no better position either, and I am afraid that the position is becoming worse every day. The real spirit of co-operation is not understood even by the workers of societies and banks, not to mention the poor, illiterate people.

QUESTION 23.—GENERAL EDUCATION.—(a) The existing system of education is neither efficient nor suited to this country. The first point to which attention is forcibly drawn is that all education worth the name is given in the foreign language and the vernaculars of the country are quite ignored. The result is that the general standard of education does not rise. Cramming, which is necessary to learn a foreign language and then to learn different sciences in the language, tells upon the health of the students. The aim of education before a student is nothing but service, and therefore he has a distaste for manual labour and for all professions requiring the same. The moral standard is not raised because the whole system of education is irreligious. Thus we find that educated people do not improve physically or morally. It is only a mental food which is provided by education, and the result naturally is that they become mere pulpit speakers rather than constructive workers. No arrangement has been made for imparting agricultural or industrial education on sound lines. As far as agricultural knowledge goes, it is considered that farming is such an easy job that it can be taken up by any person and it does not require any education at all. On the other hand, educated people consider it to be a profession fit for illiterates only. Educated people have got a bias against those who follow farming or other industrial pursuits. In the society of educated people, a clerk getting Rs.30 a month is more respected than a farmer getting Rs.200 a month or a trader earning Rs.1,000 a month. So long as an attempt is not made to give vocational training in schools and colleges, the system cannot improve. There was a possibility of some improvement if education experts were convinced that there was no harm in giving a vocational bent of mind to boys in schools and colleges, but even this is not admitted. I moved a resolution in the Intermediate Board, United Provinces, for this purpose and the Committee suggested the introduction of several subjects in high schools and colleges but, unfortunately, when the matter was considered by the Intermediate Board, it was thrown out and no action was taken on the recommendation of the Committee. It was with great difficulty that the Intermediate Board agreed to create a diploma course in agriculture equivalent to the Intermediate Examination, but it is still to be seen whether the University will allow these students to join the degree course in colleges. After a great deal of difficulty agriculture was considered to be a fit subject for experiment in vernacular middle schools, but even there the Director of Public Instruction did not agree that qualified teachers who have studied for at least two years in a special vernacular agricultural school should be allowed to work as teachers. He laid down that only trained teachers should be allowed to teach these classes after being given a training of six months only at an agricultural school. Can anybody in the world believe that a teacher will be teaching boys really something of agriculture by undergoing a training for a few months at an Agricultural School? This shows that education experts are against the idea that anything should be done for the industrial or agricultural education of the country. They always try to discourage every attempt in this line. I do not attach any bad motive, but it seems that those gentlemen have not realised the real difficulties of the inhabitants of this poor country and they want to engraft the very same ideas that prevail in foreign countries.

The Department of Agriculture seems to be very much against the idea of special agricultural schools and colleges to be handed over to the Department of Education, and, though the Government has promised several times to transfer the control to the University, nothing practical has so far been done. Every attempt is made to discourage agricultural education imparted by private agency. The history of the Agricultural Institute, Naini, and the proceedings of the Intermediate Board for the creation of an agricultural diploma course in that institution, are sufficient evidence on this point.

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(*b*) (i) We should start farmers' adult schools in every village, into which boys over twelve years and grown-up people should be admitted. They should be given elementary education in the vernacular and ordinary arithmetic by which they can write up their accounts and do ordinary calculations connected with the sale and purchase of their produce, the payment of rent and interest, &c. Besides this elementary education they should receive instruction in agriculture and should be asked to verify, on their own fields, the principles taught to them in the schools. Every school should be provided with a set of the implements that are considered to be best suited for the place and a free use of these implements should be allowed to students reading in those schools. The school should be either a day, half-time or a night-school, depending upon the circumstances of the locality concerned. The teachers should be those who understand farming very well and who can impart education to these students.

(ii) It has nowhere been started in the district. Sanction to start compulsory education in rural areas has recently been granted at certain places under the District Boards and the results are anxiously awaited, but I consider that the cultivator will resent the scheme of compulsory education unless it includes a vocational training in agriculture, as he is convinced that his children will become worthless for field operations after education, and as long as that idea exists, the success of compulsory education will not be conducive to the economic advancement of the people.

(iii) There are three main causes for this complaint, (1) boys have to leave and go to other villages at a very tender age, (2) parents have to spend something for higher education which they can hardly afford and at the same time they cannot use these boys for field operations. Thus they lose in both ways, (3) parents are convinced that a boy after reading becomes unfit for agricultural work and he is not sufficiently qualified by education to take up to service or any other job.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) The first step that seems to be necessary is that education of the right sort should be imparted to the people.

(ii) Small industries connected with agriculture should be started. Economic agricultural schemes should be proved to be beneficial by model working, just as boring operations and digging of wells, &c., done by private people. The Government should take steps to invite private people to do this work. The Government experts should give their advice free and try to encourage private agencies by giving on loan the costly machines and implements required for the purpose.

Practical steps should be taken at once to make compact areas and all facilities necessary for successful farming should be provided where a capitalist or a big zamindar wants to take to it.

(*b*) The only factor which in my opinion prevents owners of agricultural land from carrying out improvements is that they are not convinced of the advantages claimed for such improvements.

QUESTION 25.—WELFARE OF RURAL POPULATION.—(*a*) Large village populations should be discouraged unless and until some proper arrangement for drainage, etc., is provided for. People should be encouraged to have a few hamlets at one place scattered all over the area so that they may be able to live on their own holdings with ease. But such hamlets will not come into existence unless effective arrangements are made by Government for the protection of the lives and property of the inhabitants.

Nobody spends a pie over rural sanitation. District Boards spend nothing over this important subject. I consider that a special duty for improving the hygienic condition of the people commensurate with their system of

living is necessary. The conditions of this country, unfortunately, are quite different from those of foreign countries. No systematic study of rural requirements has been made and people who have no information about village life and the poverty of the people are put in charge of this work. Suggestions that they make are beyond the means of the cultivator and hence they are never adopted. In the rainy season the condition of the villages is simply appalling. Railways, canals and roads have spoiled the natural system of drainage and have not provided artificial outlets for rain water. The result is that villages are flooded in the rainy season and the people have to lead a very unhealthy life. Water collects in depressions round about the villages, affording an excellent breeding ground for mosquitoes and providing facilities for the malarial scourge. I consider that the Canal Department is responsible for the bad drainage and they should make a survey of the entire Province and should try to improve the drainage of the country. The drains that are constructed by the Canal Department are not cleaned and never looked after even when they are asked to do so.

There are no good books on the subject and the few books that are approved by the department are quite worthless. They are written by people who know nothing about village life. The methods suggested are simply useless. The language used in writing these books is beyond the understanding of the common villager.

QUESTION 26.—STATISTICS.—(*a*) (ii) The system of estimating the yield is very defective. The *patwari* finds no time to do this work nor does he take interest in it, as he gets nothing for it. The whole system is simply a farce and no reliance can be placed on the figures supplied by the *patwaris*. I have seen big mistakes creep into the reports of very responsible commissions, based on figures supplied by the *patwari*. The same remark applies to (iii).

(v) The publication of agricultural statistics should be done in the vernaculars of the Province and should give necessary information to the cultivator and the lines upon which he can improve. The system of drawing inferences from these statistics is left to the very busy people in other walks of life. Experts should be employed for preparing these reports, so that they may contain information necessary to the cultivator.

I consider that that task should either be entrusted to school teachers or to the departmental people and the former, if employed on this work, should be remunerated. A check of the statistics gathered should be made either by the departmental people or by other Government officials.

Oral Evidence.

39,628. *The Chairman*: Chaudhury Mukhtar Singh, you are a pleader of Meerut?—Yes.

39,629. You have favoured us with a note of the evidence that you wish to give. Have you any additions or correction which you would wish to make at this stage?—No. I wanted to send a note on special research work that ought to be made, and I may be allowed to send it as an answer to the first question.

39,630. If you wish to send in a supplementary note, you will, perhaps, make it as short as you can in view of the length of your note?—Yes, I shall be very brief.

39,631. I see from the leading page of your note that you suggest that there is an absence of the spirit of initiative amongst students who have passed through the agricultural colleges, and their disinclination to embark upon agriculture as a profession suggests that there is some deficiency in the curriculum or system in the Provinces. Do you think it is the

absence of sufficient practical training?—Yes, sufficient practical training, and, also, there is this defect, that the boys have no self-confidence.

39,632. If the absence of self-confidence is inherent, obviously, the agricultural college can do nothing to supply the want, but if it is due to some fault in the curriculum or system, that is quite another matter, is it not?—The curriculum also should be improved and it ought to be made more practical.

39,633. Then you suggest, on page 664 of your note, that agricultural education should be in the hands of the University?—Yes.

39,634. And you know the geographical dispositions of these institutions in the Provinces. Would you suggest that the University at this moment should take over the Cawnpore Agricultural College?—Yes, the Allahabad University should take it over. That was also proposed by the United Provinces Board of Agriculture, and it was approved by the Legislative Council.

39,635. *Dr. Hyder*: That has become a teaching and residential University?—In that case it might be attached to the Agra University.

39,636. *The Chairman*: When affiliation between these two institutions is established to the extent of the University granting a degree, would your views be met, or do you desire that the actual administrative responsibility should rest with the University?—I think that both are necessary.

39,637. On page 664, you suggest that farms should be attached to every school and that teachers would have to be specially trained in agriculture. Where do you suggest that the training should take place? In the Bulandshahr School or in the Cawnpore Agricultural College? Would that not be expensive?—I do not think that it will be expensive, as no extra arrangements will be necessary.

39,638. On page 665 of your note, you say, "The literature produced by the department through journals is simply third class and worthless." Do you regard yourself as an authority on technical literature in this field?—I do not call myself an authority on technical education, but, certainly, I have read something on agriculture.

39,639. On what do you found yourself when you make that somewhat sweeping assertion?—I have been reading both the vernacular journals issued by the department.

39,640. Let me take you away from the official mind for a moment and ask you whether you have ever heard of a gentleman who gave evidence before the Commission, Mr. Higginbottom, at Allahabad?—Yes, I know him very well.

39,641. Would you regard him as an unprejudiced person? Do you know his reputation in agricultural matters?—Yes.

39,642. Do you know that he told the Commission that the literature issued by Pusa stands very high, indeed, in the estimation of those qualified to judge in the United States of America?—I have not written the above statement about the publications issued by the Pusa Agricultural Institute; this only deals with the vernacular literature produced in my Province. Certainly, I regard it as such.

39,643. *Professor Gangulee*: Do you know the publications by Mr. Moreland?—I have seen only two of his books.

39,644. *Dr. Hyder*: In this particular passage you are referring to the popular journals?—Yes, and the pamphlets that are issued by the department in the vernacular.

39,645. Which are issued for the education of the peasant?—Yes.

39,646. You say these journals should be of a higher standard; is that the point?—Yes.

39,647. You are not referring to the technical publications of the Agricultural Department in the United Provinces?—No.

39,648. *The Chairman*: I think we ought to make that clear, because before that you say: "It will be surprising to know that under confidential orders the editors of agricultural journals and agricultural officials are prohibited from writing reviews on books written by private persons." What do you mean by that?—I think there is something wrong with that.

39,649. You must know what you yourself meant; what did you mean when you wrote the original?—Suppose there is a book written on agriculture by a private person who is not an official; he sends that book for review just as he would send it to any other newspaper, I think the Government paper ought to review it. They review all the books written by officials, but they will not review books written by private persons in these journals. They might condemn a book and say it is a very bad book, but certainly they ought to review it if the book is worth reviewing.

39,650. But then your complaint is that private attempts to publish such literature are bound to fail?—Yes.

39,651. Is not the natural inference that you wish the journals in question to publish such literature, not to review it?—I do not quite follow the question.

39,652. You say: "Private attempts to publish such literature are bound to fail if people are discouraged in taking up this work." Is it your suggestion that the reviews would assist the private persons to publish?—Yes, because the review will be a sort of authoritative pronouncement.

39,653. In answer to Question 11, you say you have more faith in improving the crops by the selection of seeds on the right lines than taking to the new seeds obtained by breeding. Why do you take that view?—Because it takes a very long time to form any opinion about a seed which is produced by breeding; it will take some time to ascertain whether it will suit a particular climate or a particular soil, and so on; but when we know for certain that a particular seed is doing all right, we can easily improve it by selection.

39,654. Have you studied the contribution made towards the improvement of India's wheat crop by the breeding of new varieties?—Yes, I have myself tried a good many varieties: Pusa 12, and Pusa 4.

39,655. What has been your experience?—In some fields they are very good, in some fields they are not; you cannot be sure that Pusa 12 will do well everywhere; it may fail miserably in many places.

39,656. I suppose that is true of any variety, is it not?—Yes. If I may be allowed to say so, the main demerit of Pusa varieties is that they have a very brittle connection between the ears and the stalks, they fall down very easily and you have to cut them early when they are not properly ripe.

39,657. At one point in your note you suggest that whenever Government experts decide that a certain variety is needed for the market, they should also arrange for the purchase of this produce at an attractive price from the cultivator. Those, I think, are your words?—Yes.

39,658. Do you really think that is a helpful proposal? Do you think that is within the limits of administrative and financial possibilities?—I think if the Government wrote to the firms dealing in those articles, naturally it would have its effect.

39,659. Your suggestion is that Government should arrange for the purchase of this produce at an attractive price from the cultivator?—Yes.

39,660. Do you mean that Government itself should buy?—The Government itself may buy it for seed purpose, or the purchasers might be asked to purchase it at an attractive price, on account of the good variety and the clean-graded produce. Purchasers might be told that a certain variety has been grown at a certain place and is available there.

39,661. Do you mean that purchasers in the open market should be invited, in a polite note by Government, to give a good price? Is that the idea?—Yes.

39,662. *Sir Henry Lawrence*: You speak of roads kept up by the District Local Boards; what is the present practice? Is the District Local Board not responsible for maintaining village tracks?—No, it is not.

39,663. In whose possession are these village tracks?—The zamindars.

39,664. And the public have no right to demand the maintenance of a village track?—The public have only this right, that if a road is enclosed in such a way that the public cannot use it properly, they can apply to take action under Section 133 of the Criminal Procedure Code to the District Magistrate or the Sub-Divisional Magistrate.

39,665. Is there no public authority with power to secure the regular maintenance of these tracks?—No.

39,666. Has there been any proposal discussed in your Legislative Council to improve this position?—At the time when the District Boards Act was being discussed, the question was raised and these tracks were included in the District Board Act; I do not remember the Section, but now if the District Board so decides, it can take control of those tracks and maintain them; but before taking possession it must acquire them by paying for them.

39,667. The Boards have to acquire them from the zamindars?—Yes, and only then they can maintain them under the new Act.

39,668. What is your proposal? That these village tracks should be acquired from the zamindars compulsorily by law?—Yes.

39,669. Without payment?—With payment, of course. I do not suppose the amount will be much, because after all, they are not used for anything; they will be regarded as unculturable land, the price will be very small, and possibly in certain cases the zamindars themselves might be willing to hand them over without asking for any compensation.

39,670. *Sir Ganga Ram*: Do you know that these tracks which you call village tracks also serve the purpose of drainage channels after the rains?—At some places they do.

39,671. At most places they do, and if the District Boards tried to acquire them, how would you deal with the drainage of the village?—They will also have the channels alongside the tracks.

39,672. You mean new drainage channels could be made?—Yes, along the roads; the tracks are sufficiently wide.

39,673. Do you know that these tracks follow the contours of the ground; that is to say, they are not straight from place to place, but they follow the contours simply for the purpose of serving as drainage channels?—There are tracks, of course, which are drainage channels as well as tracks, but there are also tracks which do not serve for drainage purposes at all.

39,674. May I ask you, are you a landholder?—Yes.

39,675. You are also a vakil?—Yes.

39,676. Why did you give up landholding and take to law? Do you think farming is not paying?—My difficulty is that the land is separated, one field at a distance, say, of one mile from another, and there is no law by which I can get land all at one place. That was one difficulty;

the second difficulty is that, although even now I am keeping a farm at Meerut even in these days, I have only a very small portion of land.

39,677. Then you favour consolidation of holdings?—Certainly, but that will not solve the problem at all, because consolidation of holdings would only govern the tenancy. The farmer zamindar also ought to be given some chance to acquire the land in a compact block so that he may cultivate it.

39,678. *Sir Henry Lawrence*: How can it be given? By whom?—The Government should acquire land for the cultivator in one compact block. There is land under the Court of Wards which might be given out. A compact area might be given.

39,679. *Sir Ganga Ram*: You mean that the Government should exercise the right of compulsory acquisition?—Yes, if it cannot be arranged by any other means.

39,680. *The Chairman*: Do you mean uncultivated or uncultivable land? —Both. The uncultivable land may there become cultivable land.

39,681. *Sir Henry Lawrence*: You propose that Government should acquire land and hand it over to private persons for private cultivation?— Yes. There are big plots which are lying practically useless; they are not used by the zamindars or needed by them.

39,682. But would they consent to part with that land?—If there is a law they will; otherwise they will not. These *rehala* (alkaline) lands and *kalar* lands are useless for the zamindar; they do not bring him in any income.

39,683. But a private person would not take *kalar* land?—*I think in* certain places he might. I was willing to pay a very good price for 1,000 *bighas* of *kalar* land which belonged to the Court of Wards.

39,684. What did you propose to do with it?—I thought I should be able to reclaim it and make it cultivable.

39,685. *Sir Ganga Ram*: A big landlord has told us that wherever land is irrigable by wells, no canal water should be given. Do you support that view?—No, I think not, and my main point is that it is very seldom that the canal water is sufficient, and if the land is to be irrigated properly it must have a well in addition. There must be combined irrigation from wells and canals.

39,686. Do you know that in the United Provinces the difficulty of the Canal Department is that their water is only taken when there is a drought, and sometimes they may have difficulty in making any revenue? Would you in these circumstances favour the idea adopted in the Central Provinces, whereby a ten years' lease is taken by the cultivators, so that the Irrigation Department does not suffer and cultivators are sure of getting water?—I would welcome that idea, but there seems to be one difficulty. Suppose the water is not available in the canal, will the Government pay for the damage so caused?

39,687. No. The Government does not pay for the damage?—Then what would happen?

39,688. The zamindar will be sure to get water when he wants it, provided, of course, nature provides water?—I think he would be in the worse position, because if the area covered by a certain outlet is increased, the water will not be increased at the same time, and Government is not responsible for giving him water at the proper time.

39,689. They cannot supply water when there is none in the rivers?— The area under irrigation is increasing every year, but the water available is not increasing.

39,690. Do you mean full advantage is not taken of the water?—Sometimes the rains fail and sufficient water is not available in the canal.

The Chairman: The witness means the canals are being extended at the expense of areas already irrigated.

39,691. *Sir Ganga Ram*: You say that water does not always reach the tail ends because the outlets are defective. Is that so?—Yes.

39,692. Have you complained of that to the Irrigation Department? In the Punjab the outlets are designed so that water must go to the tail ends?—I put several questions and moved resolutions when I was on the Irrigation Board. I was told that it was impossible. They say if the channels in the beginning are made deeper they would take more water than they used to.

39,693. You say in your note that Government should do something to stop evaporation and absorption. What is in your mind? How can Government stop that?—I do not say that is a possibility; I simply state that there is no method for doing it.

39,994. But what is in your mind? What method can be applied to prevent evaporation?—That is the question in the Questionnaire to which I was replying.

39,695. *Sir Thomas Middleton*: Have you been at any time a student in the Agricultural College?—No.

39,696. How have you come to take so much interest in agricultural affairs?—I belong to a community which is very famous for cultivation; I am a Jat. I have studied agriculture since the time I was reading for the Matriculation.

39,697. You read agriculture for the Matriculation?—No, but privately I read books on agriculture.

39,698. *Dr. Hyder*: Then you were on the Board of Agriculture?—Yes, and I was Chairman of the District Board at Meerut.

39,699. You gave some help to the Intermediate Education Board?—I was a nominated member of that Board, representing agriculture.

39,700. You say that you know personally a number of students who have read agriculture and who have land and are making no use of that land. What district is that in?—They are in the Muzaffarnagar and Meerut districts.

39,701. What is the area of the land these young men have got?—I think two of them own several villages.

39,702. Have they got employment in Government service?—One of these gentlemen started a farm in Meerut and had to leave it after a time and take up Government service.

39,703. He got remunerative employment?—Not very remunerative. He started, I think, at Rs.75 or Rs.100.

39,704. How much land had he?—He was the owner of some three villages.

39,705. But they were in the hands of tenants?—No, he himself has a compact area. He failed at agriculture and then had to leave.

39,706. *Sir Ganga Ram*: Because agriculture did not pay him?—I think so, otherwise he would have kept on farming.

39,707. *Sir Thomas Middleton*: On page 664, you say you have no faith in nature study or school plots because the teachers have not got sufficient training. That is your reason?—Yes. After all, the teachers have read only up to the middle vernacular final standard and they cannot be expected to take much interest.

39,708. Do you think steps might be taken to interest these teachers in the demonstration work of the Agricultural Department? Should they be taken to the demonstration farms and shown what is being done?—Some of them might take an interest in this way.

39,709. You do not think they would generally?—No, because they would consider it a burden.

39,710. From what class are these teachers drawn?—Generally Brahmins. I am speaking of those under the Meerut District Board.

39,711. Are there any men of your community who are teachers?—There are about ten or twelve.

39,712. Do they not take an interest in agriculture?—Very few of course, because they have no chance to take an interest.

37,713. You refer on page 665 to the fact that cultivators do not pay much attention to the demonstrations given on Government farms because, you say, they think that they are conducted by people who are more intelligent than themselves?—Yes, and who have more money at their disposal.

39,714. Is it the intelligence or the money that is the main factor in the cultivator's mind?—The fact is that the cultivators consider they are incapable of getting the same results because they do not possess the same resources and the same intelligence.

39,715. You express on page 667 a strong view on the question of Provincial Governments depending upon scientific experts who are under the Imperial Government. Do you think that every Provincial Government ought to have its own experts?—Yes.

39,716. Do you recognise the fact that it is sometimes very difficult to get experts, and that someone may be lent by the Imperial Government who will be of great use to a Province?—That is no argument. There are so many local points that have to be taken into consideration that it would be very difficult for Imperial officers to advise a Provincial Government.

39,717. But do you not agree that the Provincial Governments ought to try and get the best advice they can, from whatever source?—As far as theoretical matters go they might get the best advice in that way; but in practical matters there might be some difficulty because these officers would not have any local knowledge.

39,718. There is nothing to prevent an Imperial officer acquiring the local knowledge?—But it takes some time.

39,719. On page 669, you say that all village tracks should be acquired by District Boards. Would that not prove an impossible burden for a District Board, because of the cost in acquiring and maintaining village tracks?—I am still of this opinion, personally. In all the partition cases, there is a general clause in the partition proceedings that the village tracks will remain the common property of the zamindars. If at the time of partition the zamindars be asked to declare these tracks as the property of the District Board, they would be willing to do so and in that case nothing would have to be paid to any zamindar. Certain big zamindars may be perfectly willing to thus hand over the village tracks to the District Boards.

39,720. How would you raise funds to maintain these village tracks?—The funds might be raised by fresh taxation.

39,721. From the particular villages benefited?—That would be difficult, because the accounts would have to be kept separately, but the special taxation on " circumstances and property " may be levied and the money so received be utilised for the purpose.

39,722. Do you think that anything could be done to get the villagers to combine to maintain their own village tracks if there was some *panchayat* or other body in charge of the village?—It can be done, but personal interest would hamper the proposal. Suppose I am a big zamindar and the track belongs to me, and I am a member of the *panchayat*, then nobody will have the courage to ask me to leave the track land encroached upon by me. There will be favouritism all round; but if it is to be in the hands of the

District Boards it would be much better. If the District Boards desire, they may have subordinate bodies or committees under them.

39,723. The District Board might take charge of a group of villages through the sub-committees?—Yes, or one of the members of the Board representing that group may be lent for some time to the panchayat or the Committee.

39,724. Do you not think that it would be possible to secure labour from the villagers themselves acting under a *panchayat* of their own so that the roads might be repaired at the proper season?—It will not be done. I have tried that with respect to the drainage of the villages and I have failed.

39,725. You failed because you had nothing except your personal influence?—Yes.

39,726. *Sir Henry Lawrence*: You tried to get the villagers to work to improve the channels without payment and they would not do it?—Yes; in some of the villages where I happen to have great influence they might do it. After all it is an honorary work and nobody will like to work for nothing.

39,727. *Sir Thomas Middleton*: On page 670 of your note, you refer to the very high rates charged by traders in cattle. Is the custom in your district for the cultivators to purchase most of the cattle they require or do they breed most of them?—Mostly they purchase because it does not pay to rear their own cattle.

39,728. Therefore in effect the traders in cattle in your district are moneylenders?—Yes, in effect.

39,729. Charging high rates of interest?—Yes.

39,730. On page 676, you say with regard to the improvement of crops: "I have more faith in improving the crops by the selection of seeds on the right lines rather than taking to new seeds obtained by breeding." I think it would be true to say that most people have more faith in that method. That is the common method adopted in India?—My point is this. The Department of Agriculture makes no provision for the supply of good local seeds and the cultivators mostly have to buy their seeds from the moneylender who is not at all interested in the supply of good seeds. He purchases the cheapest variety and sells it for seed purposes to the cultivator without having any regard to whether it is a good seed or not.

39,731. You also advocate that the officers of the Agricultural Department should proceed by way of selection of seed rather than by cross breeding?—Yes. Select seed of the local varieties should be kept in the seed godowns for sale by the department.

39,732. It is for that reason, I think, that you suggest that Government should purchase the seed of select varieties?—Yes; it might be done in this way. I am in favour of selecting the seed when the crop is standing in the field. The departmental man may go and select the best seed and stock it rather than purchase from the market.

39,733. What is your objection to the method of cross-breeding?—I have no objection to that method. My main point is that we do not know what the parents of the seed are. There might be some disease which might also be imposed along with the seed.

39,734. Of course all that is taken into account. I thought your objection would be that it takes a long time?—It does take a long time, too.

39,735. It is a method which is only resorted to when necessary, and therefore you must spend the time that is necessary if you want to get certain new plants?—My point is that until the method of cross-breeding becomes successful, we should go on by selection and selection alone.

39,736. That is what is being done?—I do not think in the whole of the United Provinces there is a seed depot which has the local varieties of seed for sale. I know of no such depot.

39,737. *Dr. Hyder*: In speaking of fertilisers you say that the use of bonemeal should be encouraged. Do you think that the people at Bulandshahr would touch bonemeal?—Yes.

39,738. Are you satisfied on that point?—Yes.

39,739. You say that the postal rates and the charges on telegrams should be reduced. Do you think the cultivator makes any large demands upon the telegraph office?—During the harvest season there are many telegrams.

39,740. The middleman would get the advantage, but would it be for the benefit of the cultivator?—I think in the long run, ultimately, if the rates are reduced the cultivator would get the benefit.

39,741. Supposing the charges were reduced, I want to know whether the cultivator would benefit thereby?—Not directly.

39,742. Do you think that the cultivators in the United Provinces are largely in the habit of writing post cards?—Certainly.

39,743. They are very much educated?—I think there are a number of people in every village certainly who are educated; we know the percentage of literates.

39,744. What is your idea of utilising jails? Do you think the system would be popular?—I think the jail is the best place for the purpose of imparting education in improved methods of agriculture.

39,745. You do not think there would be an outcry against this system?—No, I do not think so. That was the idea of Mr. Marsh. We can make an experiment at Meerut. There are about 60 acres of land adjoining the Meerut jail. Even now the prisoners have to do gardening and growing vegetables for their own use.

39,746. With regard to the railway rates, can you give me any specific instance in which they fall heavily on the cultivator?—I know there is a firm, Kirloskar Bros., at Satara who complain of the rates.

39,747. I am talking about the transport of agricultural produce?—With regard to fodder, *bhusa* and other things, the rates are high.

39,748. Are you familiar with the tariff schedules of Indian railways?—I do not now remember them exactly, but I know that the rates are reduced when there is a famine; otherwise the rates are very high.

39,749. They are carried at special rates even now?—Not always but only when there is a famine declared.

39,750. What is the point about Kirloskar Bros.?—They are the manufacturers of agricultural implements. When these implements are sent to Meerut they have to pay very high rates. Take the instance of their cheapest plough. Its price is Rc.6-8-0 or 7-8-0 and it cost about Rs.2 or more to carry it to Meerut.

39,751. But the distance between the place of manufacture and Meerut is more than 1,000 miles?—But suppose we get the same from England, I think the charge is much less.

39,752. Are you sure on that point?—I cannot now give you the exact figures, but I am sure on this point that a plough imported from England would cost less than if it were bought from Kirloskar Bros.; I am quite sure on this point.

39,753. With regard to agricultural indebtedness you say: "The responsibility of litigation rests on *patwaris, kanungos* and the police and improper legislation and the rulings of higher courts." I want you to point out any

specific defects in the law. How can this nuisance of *patwaris*, etc., be overcome?—There is the question of wrong in *patwari* papers due to corruption, and I think there are thousands of cases pending at present in the revenue courts on this account. Mostly they are all the creation of *patwaris*. I may be cultivating the land but the zamindar's name will be there. The zamindar may be cultivating the land and the tenant's name may be there.

39,754. Government has passed the legislation; how can this nuisance be coped with if it exists at all?—I think something can be done.

39,755. The Government cannot go beyond that, can they?—Government can appoint more responsible and high officers who should often go to the villages and inspect the records.

39,756. The checking is done by the *kanungo* and the Tehsildar?—It is only on a very small scale. The checking by the *kanungo* is practically of no avail.

39,757. *Sir Ganga Ram*: Is there much corruption amongst *patwaris* in your Province?—Yes, very much.

39,758. Government has increased their salaries on the ground that they were inadequate?—Yes; but corruption cannot be cured by the increase of salaries.

39,759. That is what I say; corruption cannot be stopped by the increase of salaries?—No; it can only be stopped by strict supervision and proper inspection of records.

39,760. And not by appointing men of intelligence on high salaries?—I think Government will not be able to pay handsome money to these persons.

39,761. Are your *patwaris* hereditary?—Yes, as a general rule.

39,762. They are not appointed on merit?—They have to pass the *patwari* examination.

39,763. Generally the post is hereditary?—Yes; if a man dies his son has got the preference.

39,764. *Dr. Hyder*: With regard to agricultural labour, page 683, you say: "Better facilities of communication should also be provided." When you say "travelling facilities" I suppose you mean that they should travel at reduced fares or travel free?—No; if they are taken to places like Mirzapur, for instance, which is an uncultivated area, travelling facilities must be provided for them.

39,765. Has co-operation been a success in the United Provinces? Do you think that in the United Provinces you would be able to embark upon more ambitious ventures?—I think that so far as banking goes you cannot give a tenant sufficient money to get out of the clutches of the moneylender.

37,766. You say that the rural population should be spread over their holdings and effective arrangements must be made by the Government for the protection of the lives and property of the inhabitants. Do you want to see the policing of every hamlet established?—No; the people should be encouraged to have a few hamlets at one place scattered all over the area, so that they may be able to live on their own holdings with ease; but such hamlets will not come into existence until effective arrangements as suggested by me for the protection of life and property are made by the Government. If, however, the number of villages is increased and the villages themselves are far apart, in that case naturally the police force would have to be increased.

39,767. And do you think the United Provices would welcome such an increase and grant money freely for the Police Budget?—There is no question of granting money; it is a question which concerns the safety of lives and property of the people, and when this will be the main concern the people will be only too glad to provide money for the purpose. Every improvement as a matter of fact requires money.

39,768. *The Chairman*: Are you farming yourself at the moment?—Yes.

39,769. How many acres have you?—I have got about forty acres.

39,770. Do you manage the farm yourself?—No, my brother does.

39,771. You are jointly interested with him?—Yes, I am.

39,772. Has he any profession other than agriculture?—No, he is a more practical man than myself, because he does things with his own hands.

39,773. Does the business pay?—Yes, it does.

39,774. *Professor Gangulee*: You say that the medium of a foreign language puts a great strain on the mental faculties of the student, and therefore his health is undermined. Would you like to impart education through the medium of the vernacular?—Yes.

39,775. Up to what stage?—Up to the matriculation stage at least.

39,776. Then what would the student do in the University? Would he there begin to learn the alphabet of the English language?—My idea is to make English a secondary language, and to let the student prosecute his studies in the vernacular.

39,777. Up to the matriculation standard you will give him a vernacular education?—No, I would let him continue right up to the M.A.

39,778. Talking about the effect which manure produces on the mental condition of the people, you make a reference to the Hindu *sastras*? To which *sastras* are you referring? Do you mean to say that if a certain manure is applied it will produce a different mental effect? I want to know which *sastras* are you referring to there?—Take Manu, for instance, where you will find a good many *slokas* on the subject; and there is the Charak.

39,779. Do they say that manure affects the mental condition of the people? I thought that the mental conditions would affect manures?—It may look absurd, but that is true.

39,780. You definitely state on page 676 of your note that the Hindu *sastras* believe in the effect of the difference in the quality of manures on the mental condition of the people, and I wanted to know which particular *sastras* you were referring to?—I mean to say that if the grain that is produced by the help of different manures is eaten, that will have a different effect than would be the case if it were produced in a different manner.

39,781. *Mr. Kamat*: By the effect of nutrition, I suppose?—I think so.

39,782. *Mr. Calvert*: You are very despondent on the question of co-operative credit?—Yes.

39,783. If the co-operative movement in your part of the country had been controlled entirely by Jats, do you think it would have been more successful?—I think the results would have been more disastrous, because the Jat is not a calculative man.

39,784. The Jats on your side of the Jumna cannot run co-operative societies?—No, because they have not got calculative brains.

39,785. Why do the Jats living on the western side of the Jumna manage co-operative societies as successfully as they do, and why should not those living on the eastern side be capable of doing the same?—I have no experience of the Jats on the other side of the river. Here the people are poorer than the Punjab Jats; that might be one reason; and for another you will perhaps find very few Jats join the co-operative banks on my side of the country, because if they can get money even at 12 per cent. there is no reason why they should go and join the unlimited liability societies or banks and pay 15 per cent.

39,786. You do not believe in your fellow Jats much?—I have said that they are not calculative; they do not take care of their annas and pies. In

the case of a co-operative credit society, one must be really calculative; a man must know how much interest would be given, where the money would be deposited, and what is the balance which is lying idle: all these details should be known to him.

39,787. There is some difference between the Jats of the Delhi Province and the Jats just across the railway bridge?—No.

39,788. The Jats here are running co-operative societies very well?—I do not know; generally there are very few Jats who have joined the societies on my side.

39,789. *Mr. Kamat*: You have said something about the planting of trees and the rights of tenants as opposed to zamindars, and I think you also said that you wanted some legislation in this respect. Would you please amplify what the difficulty is, and also let us know what is your remedy?—According to law every tree, whether fully developed or not, belongs to the zamindar.

37,790. And therefore the tenant uproots the tree?—Yes; neither the tenant nor the zamindar is allowed to cut it.

39,791. So that, as a result of this dispute between the tenant and the zamindar, no trees can be grown and the land does not improve so far as the new growth is concerned?—No.

39,792. Then what is the remedy for that?—I suggest that if a tree is reared and grown on the holding of the tenant, it must belong to the tenant who may, if he wishes to do so, cut the tree.

39,793. But if it is planted by the zamindar?—It cannot be planted by the zamindar on the holding of the tenant.

39,794. *Raja Sir Rampal Singh*: You have suggested that the Court of Wards may lease out cultivable lands to the people for the purpose of farming. Do you think that that proposal would be favoured by the wards?—Why should they object?

39,795. What right has the Court of Wards to lease out lands to certain persons in the way of giving perpetual rights?—The leases may be for seven, ten or twelve years; the whole thing depends upon the circumstances of the case.

39,796. Would anybody come forward to begin farming without first obtaining permanency rights from the Court of Wards?—Yes, the tenants would be forthcoming for less period too. There are cases of uncultivable land from which the Court of Wards is deriving no benefit, and naturally if the land is given out on a lease of 99 years, the wards will not dislike the idea, because otherwise the estate will be getting nothing from such land.

39,797. But there would be a margin for improvement after the ward had attained majority. In my own part of the country, wards will raise very great objection if the Court of Wards lease out such lands to outsiders without their consent and permission?—I doubt it very much; at any rate, it does not appear to be an impossibility. Rather it seems to be quite possible that the wards themselves might have the ambition to lease out those lands themselves directly when they attain majority.

39,798. Are you quite satisfied with the management of the Court of Wards?—I think the percentage that is charged is very high; it varies from 10 to 12 per cent.

39,799. *Sir Ganga Ram*: Do those landlords who are the sole owners of villages look to the health of the tenants in the way of giving them a good water supply or providing sanitary houses under hygienic conditions? Do they do nothing to make life worth living?—I think they are not interested in that question at all.

39,800. They are only interested in getting their rents?—Yes.

(The witness withdrew.)

The Commission then adjourned till 10 *a.m. on Tuesday, the 22nd February,* 1927.

Tuesday, February 22nd, 1927.

DELHI.

PRESENT:

Sir HENRY STAVELEY LAWRENCE, K.C.S.I., I.C.S. (*Chairman*).

Sir THOMAS MIDDLETON, K.B.E., C.B.
Rai Bahadur Sir GANGA RAM, Kt., C.I.E., M.V.O.
Sir JAMES MACKENNA, Kt., C.I.E., I.C.S.
Mr. H. CALVERT, C.I.E., I.C.S.
Professor N. GANGULEE.
Mr. B. S. KAMAT.

Mr. J. A. MADAN, I.C.S.
Mr. F. W. H. SMITH } (*Joint Secretaries.*)

PANDIT MADAN MOHAN MALAVIYA, Member of the Legislative Assembly and Vice-Chancellor of the Benares Hindu Assembly.

Replies to the Questionnaire.

QUESTION 1.—RESEACH.—Research is the highest stage of education. A consideration of it will naturally come in after the general system of agricultural education has been considered. Assuming that a good system of agricultural education has been provided for in schools and colleges, I would suggest that there should be a Faculty of Agriculture in every University, and ample facility of every kind (financial and other) should be given to such Faculties to organise and promote scientific investigation and research in consultation with each other. Scientific and industrial research, when carried on by Government departments or under the control of an administrative officer of Government cannot become as popular and fruitful of good results as it would be if it were associated with the Universities. In my opinion, even the money that has been spent at Pusa would have borne much greater fruit if the institution had been established at, and were a part of, a residential University. A University attracts the most promising youth of the country; it is the best centre for propagating ideas and creating enthusiasm for any subject among the student population. If the Professors and students of the Faculty of Agricultural Science will find themselves working at one centre in close proximity to those of other sciences, they are likely to find the atmosphere far more inspiring than in an isolated institution away from a University.

In view of the immensity of the range of agricultural problems to be investigated, we need a large supply of competent researchers. We must adopt several measures to create them and useful guidance may be found in this direction by drawing attention to some of the recommendations of the "Interim Report of the Consultative Committee on Scholarships for Higher Education," which was published by the Board of Education in England in 1916. They said:—

> "The most useful thing that can be done without any increase in the means, is to encourage research in existing institutions after graduation. Given a limited amount of money available annually, the first need would be to assist existing institutions for training in science and technology, to improve their equipment, increase their staff, attract more highly-qualified teachers, and introduce new subjects of study; and to establish new places of higher technical and scientific instruction where needed. To bring existing institutions fully up to national

needs, a greater capital sum and income would be required. But any sum well expended would be useful. . . . Improved and extended higher secondary education is needed. Side by side with this, with the strengthening of Universities and technical schools and with an increasing demand for scientific workers, an increase in the supply of scholarships from secondary schools and Universities will be required. This should move *pari passu* with other improvements."

Dealing with the same subject, the Committee of the Privy Council for Scientific and Industrial Research said in their report for the year 1915:—

"If we were asked to state the conditions that appear to us necessary for the success of our work in the shortest possible terms, we should reply: first, a largely increased supply of competent researchers; secondly, a hearty spirit of co-operation among all concerned, men of science, men of business, working men, professional and scientific societies, Universities and technical colleges, Local Authorities and Government departments. And neither condition will be effective without the other.

"The responsibility for dealing with the grave situation which we anticipate, rests with the education departments of the United Kingdom. We shall be able to do something to encourage a longer period of training by the offer of research studentships and the like, but that will not suffice. It is useless to offer scholarships if competent candidates are not forthcoming, and they cannot be forthcoming in sufficient numbers until a large number of well-educated students enter the Universities. That is the problem which the education departments have to solve and on the solution of which the success of the present movement, in our opinion, largely depends. . . . All the measures mentioned above will be necessary if the result desired is to be brought about."

In this connection, I beg to point out that the Benares Hindu University can be made a particularly suitable centre for promoting agricultural research. From its very inception it has recognised the need and importance of agricultural education. In the Prospectus of the University which was published in 1911 it was stated:—

"It is proposed that the second college (the first being a college of Science and Technology) to be established should be the college of Agriculture. . . . For a country where more than two-thirds of the population depend for their subsistence on the soil, the importance of agriculture cannot be exaggerated. Even when the manufacturing industries have been largely developed, agriculture is bound to remain the greatest and the most important national industry of India. Besides, agriculture is the basic industry on which most of the other industries depend. As the great scientist, Baron Leibig, has said: 'Perfect agriculture is the foundation of all trade and industry—it is the foundation of the riches of the State.' The prosperity of India is, therefore, most closely bound up with the improvement of its agriculture. The greatest service that can be rendered to the teeming millions of this country is to make two blades of grass grow where only one grows at present. The experience of the West has shown that this result can be achieved by means of scientific agriculture," etc., etc.

The University began its work in 1917. In 1919 it had a scheme for an Agricultural College prepared by Dr. Harold Mann, the Principal of the Poona College of Agriculture, and Sir Ganga Ram, the Honorary Chief Engineer of the University, which was to cost about 10 lakhs. His Highness the Maharaja Sahib of Benares, a Patron of the University, was pleased to sanction a permanent lease of 2,100 acres of land between the University grounds and the river Ganges for the purposes of an agricultural farm. Sir Ganga Ram has promised to meet the full cost of a canal to irrigate the land, and has been pressing that its construction should not be delayed.

We have applied to the Government of the United Provinces for the acquisition of the land needed for the canal. I am grateful that the President and members of this Commission honoured the University by a visit. As the Commission would have noted, the University has built up well-equipped Departments of Physics, Chemistry, Geology, Botany, Zoology, Mechanical and Electrical Engineering, and Industrial Chemistry, and a botanical garden. Its Department of Botany is particularly well equipped for Plant Physiology. It has already got in its possession about 500 acres of land which can be used for the purposes of the college. Besides, in addition to the 2,100 acres mentioned above, there is plenty of land around which can be available for demonstration and investigation. The Council of the University believe that, situated and equipped as the University is, with its number of students growing, it is not only suited to become a great place for agricultural research, but also an important centre for demonstrating the great possibilities of scientific agriculture and for spreading a living knowledge of it in all the surrounding country, both among landholders and tenants. If this view should commend itself to the Commission, and if it should recommend that the Government should help the University with suitable recurring and non-recurring grants for the purpose, the University would gratefully co-operate with the Government to build up an important centre for promoting scientific agriculture.

QUESTION 2.—AGRICULTURAL EDUCATION.—Various Commissions and Committees have been unanimous in recommending that the edifice of agricultural education should be raised on elementary education, and, therefore, where the progress of general primary education has been so poor, it may safely be assumed that the seed of agricultural education has not yet been sown. Writing on the subject, nearly a century after Elphinstone, Mr. (now Sir James) MacKenna said:—"There is probably no subject conected with agriculture on which so much has been written as agricultural education, none, perhaps, in which less has been effected. It has been debated at numerous conferences and has been the text of many writers, but there are practically no results to show. The Famine Commissioners, so long ago as 1880, expressed the view that no general advance in the agricultural system can be expected until the rural population had been so educated as to enable them to take a practical interest in agricultural progress and reform. These views were confirmed by the Agricultural Conference of 1888. . . . The most important, and, probably, the soundest proposition laid down by the Conference was that it was most desirable to extend primary education amongst the agricultural classes. But with the enunciation of this basic principle, other resolutions were passed which, while containing much that was excellent, probably led to the extraordinary confusion of subsequent years." The same writer goes on to say:—"Any attempt to teach agriculture in India, before investigation has provided the material, is a fundamental mistake which has seriously retarded development, and this mistake has affected, not only elementary, but, to a much greater extent, collegiate education."

This is where we stand after half a century of enquiry, discussion and trial! It is instructive to recall that during the same period, Japan established an excellent system both of general elementary and agricultural education. It is fully described in Mr. H. Sharp's *Educational system of Japan** (1906). In addition to primary schools, they established agricultural institutions of three grades, elementary, secondary and advanced. "Under the first head there are 503 supplementary agricultural schools, and 43 of Class B, under the second, there are 57 schools of Class A, together with a secondary course in Soppora School, whilst for advanced instruction there are three Government institutions. The

**Vide* pp. 219-238.

higher primary schools have recently been ordered to include either agriculture, commerce or manual work in their curriculum." There were 503 supplementary agricultural schools, attended by boys of the agricultural class. It is worth considering whether a similar system of elementary, secondary, and advanced agricultural institutions may not be established in every Province in India. This was in 1906. The number of these institutions must be greater now. The history of the first attempts of Japan at a scientific treatment of agriculture is also very instructive. Says Mr. Sharp:—"The Government established experimental farms, imported domestic animals, seeds and implements, and tried its hand at cattle-breeding and the like, but most of these attempts ended in failure, for want of trained men to take charge of them. The authorities then turned to the training of such men; the graduates of the agricultural college of Tokyo were set to carry out simple experiments with the help of farmers; the results of these were so satisfactory that the farmers were deeply impressed with the importance of the scientific treatment of farming; and by 1893, an Imperial Agricultural Station was firmly established. In the next three years there were added to it nine branch stations, which carried out simple experiments, and tried to establish similar stations for themselves, Government promising an annual subsidy of £15,000. The prefectures began to vie with each other in organising experimental stations. They maintained 40 experimental farms, each employing several experts. Rural districts also maintain 110 experimental stations of a similar type; and there are others again belonging to towns, villages, or associations of farmers' sons. Further, there are five local agricultural institutes . . . Much good again has been done by travelling lecturers, who stay in a place for a week or two, lecturing on soils, manures, implements, etc., and answering enquiries from the farmers of the district. They also look after experimental farming, attend to local agricultural shows, and make themselves generally useful. It is found that the farmers are willing to listen to these men, of whom there are over 300. In 1903 there were 46 prefectural agricultural societies, spending over £5,000; 561 such societies in districts or cities, and over 10,000 in towns and villages. In the preceding year Government had granted about £1,500 to the prefectural societies."

I think that if graduates are trained in adequate numbers at agricultural colleges and are similarly employed here to carry out experiments with the help of farmers, they will be able to enlist their interest in such experiments and generally in the scientific treatment of agriculture.

QUESTIONS 5 AND 6.—FINANCE AND AGRICULTURAL INDEBTEDNESS.—The main causes of borrowing are insufficiency of income, the rigidity of the land revenue demand, the demands of religion and social customs, and the want of credit facilities.

The remedy for it will be found in reducing the land revenue demand, securing the entire profit of the reduction to the tenant, in education, in co-operative societies and agricultural banks.

The late Sir William Wedderburn advocated the establishment of agricultural banks, as far back as 1882. The late Mr. Mahadeva Govind Ranade read a valuable paper on "The Reorganisation of Rural Credit in India" before the first Industrial Conference at Poona in 1891. It is a powerful plea for the establishment of agricultural banks and might yet be read with advantage. It is a matter for regret that such banks have not yet been established. They should be.

QUESTION 16.—ANIMAL HUSBANDRY.—The great importance of dairying in a country where the bulk of the people are vegetarians should be recognised. The great law-giver, Manu, has laid down that a certain amount of land should be left in every village as free pasture. I am informed that this ancient and wise rule is still followed in some parts

of the Punjab. I strongly recommend that the Government and the people should be advised to provide ample grazing land in every *tahsil* and district. This would lead to a great development of the dairying industry, and contribute in a considerable measure to strengthen the economic condition of the cultivator.

QUESTION 17.—AGRICULTURAL INDUSTRIES.—India was noted for its manufactures up to the beginning of the last century. The decline of Indian industries, the growing imports of British manufactures and the exports of raw produce from India, led inevitably to the impoverishment of the manufacturing classes in all parts of the country and drove a growing proportion of the population to depend more and more upon the land. This led to more frequent famines. There were 24 famines between 1851 and 1900. After the disastrous famine of 1877-78, the Government appointed the Indian Famine Commission to enquire " how far it is possible for Government by its action, to diminish the severity of famines, or to place the people in a better condition for enduring them." In their Report, the Commission said:—

> " A main cause of the disastrous consequences of Indian famines, and one of the greatest difficulties in the way of providing relief in an effectual shape is to be found in the fact that the great mass of the people directly depend on agriculture, and that there is no other industry from which any considerable part of the population derives its support. The failure of the usual rains thus deprives the labouring class, as a whole, not only of the ordinary supplies of food obtainable at prices within their reach, but also of the sole employment by which they can earn the means of procuring it. The complete remedy for this condition of things will be found only in the development of industries other than agriculture and independent of the fluctuations of the seasons."

The Commission made many recommendations for " the encouragement of a diversity of occupations " among the people. Among others they said:—

> " Among the articles and processes to which these remarks would apply may be named the manufacture and refining of sugar; the tanning of hides; the manufacture of fabrics of cotton, wool and silk; the preparation of fibres of other sorts and tobacco; the manufactures of paper, pottery, glass, soap, oils and candles."

In 1916 the Government of India appointed an Industrial Commission on which I had the honour to serve. It made copious recommendations for the encouragement and development of industries. Departments of Industries have been established in the Provinces. But a well-organised system of Industrial Education and of organised cottage industries has yet to come. I recommend that, here again, a system of industrial schools such as has been adopted in Japan should be introduced. To start with, there should be at least one industrial school established in every district, and later on in every tahsil, where boys might be trained in carpentry and smithy work, so that they may be able to meet the ordinary needs of the agriculturist of the tahsil. There should be a museum established in every district with a view to awaken and maintain interest in industrial effort. Provision should be made in the district school for imparting instruction in hand-spinning, hand-weaving of cotton, wool and silk, tanning, shoe-making, making of paper, inks, soaps, paints, varnishes.

QUESTION 22.—CO-OPERATION.—Government deserve credit for having started and encouraged the system of co-operative credit societies. The system has been growing, but what has been done is very small compared to what needs to be done in this matter, and I cannot do better in this connection than draw the attention of the Commission to certain observations of Sir Daniel Hamilton, who was the Commerce member of Lord

Curzon's Legislative Council. In an article reproduced in *New India* of 16th August, 1916, Sir Daniel Hamilton, writing under the heading of "India—Her Present and Her Future," wrote as follows: "One hundred and forty years ago the finger of Adam Smith pointed to the weak spot in British rule, and the finger of Sir Edward Maclagan points to the same danger spot to-day. In 1775 Adam Smith wrote: 'In Bengal money is frequently lent to farmers at 40, 50 and 60 per cent. and the succeeding crop is mortgaged for the payment . . . Such enormous usury must in its turn eat up the greater part of the profits.' In 1915 Sir Edward Maclagan wrote: 'The moneylenders' rate we have found in many places to be as much as 38, 48 and 60 per cent. per annum.' Financially, the people stand where they did at the commencement of British rule. Is it wise to leave them standing there any longer? The great industry of four-fifths of the Empire still without a banking system, 250,000,000 of people without credit or cash. The *sowcar's* reef is the rock on which India lies stranded, and until the ship of State with its huge living freight is afloat on the silver sea of credit, India will never reach the haven of peace and plenty and power. We have given the people a railway system which removes their surplus crops, but we have not yet given them a banking system to bring back the price. The world takes the surplus crops, the *sowcar* and the trader take the money, and the devil takes the people."

In another portion of the same article Sir Daniel Hamilton said: "The want of credit among the masses is, I believe, a chief cause of unemployment and unrest among the classes. Multiply credit among the masses and you multiply employment and peace for all. Credit is purchasing power, and an increase in the purchasing power of 315 millions of people will start the greatest trade boom the world has ever seen, and create employment for man and beast."

The people should be encouraged to form societies for co-operative purchase and marketing, for effecting improvements in their villages and carrying out objects of common concern, for the use of agricultural machinery, for cattle-breeding, for the crushing of bones for manure, &c.

QUESTION 23.—GENERAL EDUCATION.—The second important means of promoting the welfare of the agriculturist to which I wish to invite attention is universal, free, compulsory, primary education, and I cannot better express my ideas on this subject than in the words of Montstuart Elphinstone, a former Governor of Bombay, uttered in 1823, which are still true as ever:—"I can conceive no objection that can be urged to these proposals, except the greatness of the expense, to which I would oppose the magnitude of the subject. It is difficult to imagine an undertaking in which our duty, our interest, and our honour are more immediately concerned. It is now well understood that in all countries the happiness of the poor depends in a great measure on their education. It is by means of it alone that they can acquire those habits of prudence and self-respect from which all other good qualities spring. We have all often heard of the ills of early marriage and overflowing population; of the savings of a life squandered on some one occasion of festivity; of the helplessness of the ryots, which renders them a prey to moneylenders, of their indifference to good clothes or houses, which has been urged on some occasions as an argument against lowering the public demands on them; and, finally, of the vanity of all laws to protect them, when no individual can be found who has spirit enough to take advantage of those enacted in their favour; there is but one remedy for all this, which is education." Thirty-one years later the foundation of the present system of public education was laid in this country by Sir Charles Wood's famous despatch of 1854, in which the Honourable Court of Directors said that it was one of their most sacred duties to be the means, so far

as lay in them, of "conferring upon the natives of India those vast moral and material blessings which flow from the general diffusion of useful knowledge," and they directed their Government to take active measures to promote the education of the masses. The Famine Commission which reported in 1880 and the Agricultural Conference of 1888 also recommended that steps should be taken to extend primary education amongst agricultural classes. The Education Commission appointed by the Government of India recommended in 1884 that strenuous efforts should be directed in the future to provide for, extend and improve, the elementary education of the masses. In the important Resolution of the Government of India, dated 20th March, 1897, on Agricultural Education, it was urged that the extension of primary education among the agricultural population was essential to all agricultural improvement and reform. There have been many other similar pronouncements of the Government in favour of the extension of primary education among the agricultural population. Notwithstanding all this, however, primary education has made but little progress among them. The percentage of the number of children at school to that of the total number of the school-going population in the whole of British India has risen in these hundred and four years to only 6·05 per cent. for males and 1·24 for females. Nearly 90 per cent. of the population of India as a whole is still illiterate. In striking contrast with this has been the progress of education in other countries. Since the Education Act of 1870 made education compulsory in England, illiteracy has been practically banished from the land. Japan has achieved the same progress. The Compulsory Primary Education system was introduced in 1872; by 1873 (the number at these schools had already reached 28 per cent.) the percentage had risen to 51, by 1893, to 59 and by 1904, to 93 per cent. of children of school-going age. It must be higher still now.

I have drawn the attention of the Commission to these facts to show that, if the condition of the agriculturist is really to be ameliorated, and if the recommendations of the Commission are not to share the fate of those of the other Commissions, it is essential that the system of compulsory primary education should be introduced as early as may be practicable in every part of British India.

QUESTION 25.—WELFARE OF RURAL POPULATION.—In his valuable brochure on *Agriculture in India*, published in 1915, Mr. (now Sir James) MacKenna said:—"Of the industries of India agriculture is, by far, the greatest, and in a rough estimate recently made the annual value of the agricultural produce of British India is taken at over 1,500 crores of rupees, or £1,000,000,000. Of its immense population at least two hundred millions are dependent for their livelihood on agriculture or the industries subsidiary to it, and except in the few manufacturing cities, the atmosphere is altogether agricultural. Over vast tracts of land the only common interest is agriculture, the monsoon, the state of the crops, the health of the cattle." I fear that, notwithstanding these patent facts, the importance of agriculture in India is not fully realised by the bulk of the officers of the Government as it is not realised by the people. I am led to this opinion by their attitude towards agriculture. There has been no lack of expressions of sympathy with the agriculturists. Some years ago, a former Viceroy said:—"Our land revenue tells a tale of increasing wealth—of wealth to great proprietors—but still more, I hope, of abundance of the necessaries of life to the small tiller of the soil. He is the man we must strive to help. He is to a great extent the backbone of the population of India. On his welfare depends much of the happiness and contentment of the people." But these expressions of sympathy have not, unfortunately, led to adequate and systematic efforts to promote the welfare of agriculturists. I venture to

think that the enquiries of the Commission have already shown that, acknowledging all the improvements which have been effected in some parts of the country in the lot of the agriculturist, and speaking generally, the small tiller of the soil is still not provided with a sufficiency of the necessaries of life. I say this with special reference to the condition of tenants in the United Provinces and Bihar and Orissa. In all ordinary years the cultivators live for a good part of the year on advances, and in unfavourable years they have to increase the amount of their debt. A very large number of the lower middle and lower classes of the population clearly demonstrate by the poorness of their physique that they are habitually starved. As a rule, a large proportion of them are in debt. A comparison of their condition with the condition of the tillers of the soil and landless labourers in some more favoured parts of India, and with those of the countries of the West, would show how great is the danger to the agricultural prosperity of India if the condition of its agriculturists continues to deteriorate, as I fear it has been deteriorating. The statistics of births and deaths are sadly eloquent of this.

It should be remembered that we are living now in an age of world competition. The prices which wheat and cotton and other produce of the soil fetch in India are determined by the output of those articles in America, Canada, Egypt and other countries. In this competition the difference in the physical, intellectual and moral equipment of the tillers of the soil in different countries must form an important and determining factor. If the prosperity of the Indian cultivator is to be assured, if he is to hold his ground in the industrial warfare to which he is exposed, he must be helped to live a more robust, and, economically, a higher life in the future. He must be helped to cultivate more self-respect and self-reliance and a proper sense of his dignity as a man. He must be taught to look an officer of Government, executive or judicial, revenue or police, and a zamindar or his agent, in the face. He must be taught to think that he has the same elementary rights of citizenship as his more prosperous fellowman.

Towards this end the first thing needed is that a larger share of the fruits of his industry should be left to the cultivator than is the case at present. I urged this twenty years ago as a member of the United Provinces Legislative Council, and I beg to repeat here what I said there. After pointing out the deplorable condition of the people in those Provinces, I said:—"That is the state of things which loudly calls for improvement. And the first measure that I would suggest towards that end would be a reduction of the burden on land. The vast mass of the people of these Provinces depend for their subsistence on land. In the report of the last census of 1901, over 66 per cent. of the people were returned as workers at, or dependent on, pasture and agriculture of all kinds. A reduction in the land revenue demand, which would result in a larger measure of the fruits of his industry being left to the tiller of the soil than is the case at present, would be the surest means of effecting an improvement in his position. I would go further and say that nothing else will, without it, bring about the measure of improvement which is needed. I am supported in this view by the opinion of no less eminent an authority than Mr. J. E. O'Connor, late Director-General of Statistics in India, expressed in the admirable paper which he read nearly two years ago before the Society of Arts in London. Speaking with an experience of forty years, spent on a study of the economic condition of the people, Mr. O'Connor pointed out that the condition of all classes of persons who depend directly on land calls for much improvement, and pleaded earnestly for a change in the present agrarian policy of the Government. 'It is no complete defence of that policy,' as he rightly observed, 'to compare the assessment on the land to-day with the assessment in the days of our predecessors. It does not follow that we are moderate in our demands on the land because we do not take so much as

was squeezed from the cultivators by Rulers and Governors who were highly esteemed if they did a man the favour of allowing him to live. We ought to arrange to let him live and thrive, not take from him the competition rent of a private landlord.' "

" Mr. O'Connor went on to point out in clear words the right course which ought to be pursued if the condition of the agriculturist is to be improved. He said:—' It is doubtful whether the efforts now being made to take the cultivator out of the hands of the moneylender will have much effect, or, even if they have the fullest effect, that they will materially improve the cultivator's position, until a large share of the produce of the soil is left in his hands, and he is protected against enhanced assessment by Government officials and against enhanced assessment by private landlords. This, as I have said, is much the most important of Indian industries, more important than all the rest put together, and it should receive from the State more discerning attention than, I am afraid, has as yet been given to it. We must appreciate to the full all that the State is doing, or proposing to do, in the provision of irrigation, in the provision of advances for improvements, in lessons on reformed methods of cultivation, in the introduction of new plants and improved implements; but important as these are—specially the development of irrigation—I have little doubt that the reduction of land revenue by 25 or 30 per cent., if the reduction is secured to the profit of the cultivator, would be of far more value in the improvement of the class who constitute the bulk of the population and who contribute most largely to the finances of the State.' "

General.—I earnestly desire that the labours of this Commission should usher a new era of agricultural improvement and reform in this country. For this it is necessary that the importance of the subject should be brought home both to the officers of the Government and to the people in a striking manner and their interest and enthusiasm enlisted in the cause. Towards this end, I beg to suggest that a Royal Agricultural and Industrial Institute should be created with His Majesty the King Emperor as its Grand Patron and His Excellency the Viceroy and the Ruling Princes of India as Patrons, and its branches established in every district in India. It should be the object of this association to devise measures to enlist and maintain the interest of the people in the improvement of agriculture and generally in rural reconstruction. The villages should be improved and should provide all the advantages of education and the amenities of a civilised life free from the disadvantages of town life. The Government and the public owe it to the teeming millions of cultivators who toil and moil to keep them provided with all that makes existence comfortable, that a grand sustained endeavour should be made to ameliorate their condition and to promote their happiness. I hope and pray that the labours of the Commission may lead to this result.

Oral Evidence.

39,801. *Sir Henry Lawrence*: Pandit Madan Mohan Malaviya, you are a Member of the Legislative Assembly and the Vice-Chancellor of the Benares Hindu University?—Yes.

39,802. We are much obliged to you for your note which has just reached us?—I am sorry I could not send it earlier.

39,803. We cannot examine you with a detailed knowledge of your note, but if you will develop your ideas, we will be glad to hear what you have to say. I see one chief point that you make is the desirability of the encouragement of agricultural teaching in the University?—Yes.

39,804 You propose, I understand, to have a Faculty of Agriculture in the Benares Hindu University, is that so?—Yes.

39,805. How far have you gone towards establishing that Faculty?—We have done nothing beyond preparing a scheme. We had a scheme prepared in 1918 by Dr. Harold Mann and Sir Ganga Ram and we have not been able to obtain funds. Sir Ganga Ram has promised us a lakh of rupees for a canal; in fact he promised to bear the whole cost of the canal. We have applied for the acquisition of the land and we have not yet got it. Then we are waiting for a donation from the public or help from the Government in order to start it. The Hindu University has been started mainly with the help of the public donations, from the Princes and the public. We have raised a crore and three lakhs from the public and the Government contributed last year two lakhs. So we are waiting for a donation from some public donor or from the Government.

39,806. All your money is spent on buildings and land?—We have spent nearly 65 lakhs on buildings and equipment because we had to start on an entirely new site and we had to keep 50 lakhs as a permanent endowment.

39,807. So at present you have not got the funds necessary for carrying on the agricultural teaching which you wish to?—No.

39,808. In this scheme is it your intention to have some research work done in agriculture?—Certainly; we are already doing it in our Botanical Department. We are carrying on research on plant physiology and it has been going on for three years. In fact the Benares University, I understand, is the best equipped of all Universities in plant physiology; so I was told.

39,809. You have not been able to do anything towards collecting your staff for agricultural teaching and that will all have to come in the future?—Yes.

39,810. Will you be able to secure men of the standard you require for teaching agriculture?—Certainly. Professor Inamdar is a graduate of the Poona Agricultural College and he is also a Cambridge man. He is the Professor of Botany in the Hindu University and he is carrying on this research in plant physiology; also another student of his is carrying on the work. So we shall not have difficulty in finding men competent to teach.

39,811. Can you tell us what is your view of the relation that should obtain between research work done by the Imperial Government and research work done by the Provincial Governments? Have you studied that?—No, I have not studied that point; but my opinion is that so far as possible research should be carried on at the Universities and at other technical institutes established by the Government and largely and increasingly at the Universities. If you want to interest a growing number of young men in research work, it is best to concentrate it in a large measure at the Universities, because you attract there youths from different parts of the country. They are keen about their work and the result is likely to be more satisfactory than otherwise.

39,812. Is it your idea that these youths will be attracted to taking a degree in agriculture or that they will study agriculture as one of the subjects in a degree in science or something else? What is your idea?—My idea is that they should take a degree in agriculture; also a certain amount of knowledge should be imparted in other degree courses as an optional subject.

39,813. Degree in science?—Yes; both systems should be open so that those who want to go up for a degree in agriculture will have more of it than those who want to take a science degree not specially in agriculture.

39,814. Has your University already worked out any syllabus for including agricultural subjects in your science degree?—Not yet, because we are not yet equipped to teach it.

39,815. As between the Imperial Government and the Provincial Governments, should research work be conducted by officers of the Imperial Government or by the Provincial Departments of Agriculture?—I think all officers, whether they belong to the Imperial Government or the Provincial Government, should be attached to Universities except in cases where an institute has already been in existence and is at work. But officers of Government, whether they belong to the Government of India or the Local Governments, working independently, will not be able to create as much enthusiasm for research as officers of the Government working at a University.

39,816. You have in view something like the Cambridge Degree of Agriculture, have you?—I have not got a very clear idea of that degree, because I have never been to England. I have not looked into their curriculum.

39,817. For the most part agriculture is taught in separate institutions in England?—That is our idea; we want a separate College of Agriculture within the University.

39,818. *Sir James MacKenna*: Like the College of Engineering?—Yes. We have a College of Engineering, a College of Arts and Science. We want to have it within the University so that students will have all the benefit of the academic atmosphere of the University and the corporate life.

39,819. *Sir Henry Lawrence*: I am not quite clear how an institute such as Pusa will come under your scheme. You would not propose that Pusa should be related to any University, would you?—I would for this reason, that these very people who are carrying on the work at Pusa ought to be able to be available to the University so that the students may derive the benefit of their knowledge and experience.

39,820. *Professor Gangulee*: For post-graduate work?—Yes, to guide post-graduate work.

39,821. *Sir Henry Lawrence*: At present Pusa takes men for post-graduate work. You would not limit post-graduate work to one particular University?—No, I would not.

39,822. Apart from University teaching and the research connected with it, research work is being done by the Department of Agriculture. It is in relation to that that I want your opinion, whether such officers should be employed by the Government of India or by the Provincial Governments; have you thought about that?—I should put them in the University; or if there is a special institute like the Government of India Institute at Pusa or Dehra Dun, they may continue to work under the Government of India; but I am entirely in favour of their being attached to one University or more.

39,823. Now there is work going on down at Coimbatore, sugar cane research work. Have you ever seen that? You have not been there?—No, I have not.

39,824. That is a very important branch. It would not, so far as I can see, have any close affinity to any course of teaching in the University; it is rather outside that. At this moment, the Government of India employs certain officers to work down in Coimbatore and send their canes to all the different Provinces, including the United Provinces, where a good deal of work has been done. That is a work being done by the Imperial Officers working inside a Provincial Government area, and a question has been raised whether that is the best method of work or whether those officers should be definitely placed under the control of the Provincial Government?—In my opinion they should work under the jurisdiction of the Provincial Government, and as for special work of that nature, of course it is to be kept up for the good of the country as a whole. Particular experiments may be made and particular research

carried on at University centres wherever these institutions exist. For instance, the Indian Cotton Committee sent a particular problem to Professor Inamdar, who grew a large number of cotton plants and was carrying on experiments when he suddenly fell ill. So the Professors who are placed at Universities will be able to carry on research in particular matters if they are asked to do so, but where institutions like those in Coimbatore exist the experiments should be carried on on the spot; but the officer in charge of such an institution should, in my opinion, be placed under the Provincial Government.

39,825. Why do you prefer that?—The Imperial Government is far too far away from the seats of these institutions, and the Imperial Government has not got any member on the staff of it particularly qualified to examine the research work that is going on in the different institutions. There may be an officer for a time, but you are not sure that you will have such an officer always, whereas the Provinces are large enough to require a self-contained arrangement and they have Universities where you have got a number of scientific men working; these experts working within the Provinces will be able to collaborate with other Professors of Science at the University, getting assistance from them, assisting them, and on the whole they are likely to turn out better work than if they are left to work in isolation.

39,826. Improbability of getting skilled control from the headquarters of the Imperial Government is your main obstacle?—That is one thing. Secondly the officer will not have the same inspiration that a man working at a University within the Province working together with the men in the Province, will have. I will give an illustration. A Professor of one subject in the Benares Hindu University talks to a Professor of another subject in the University and I have found that sometimes one of the Professors suggests a problem of research which is taken up by the other Professors, so that the larger the number of scientific men we can gather at one centre, the better will it be for the cause of scientific research and that is more likely to be the case when you have these officers at present working under the Government of India placed definitely under the Provincial Governments.

39,827. I am looking at it from the point of view of finance. Do you think it is more likely that agricultural research will be liberally financed by the Imperial Government or by a Provincial Government?—It should be financed by the Provincial Government. Agriculture is the most important of our industries. It has never yet had the chance of development on scientific lines. A great deal of expenditure is needed and the Provincial Governments must be instructed and made to enthuse about the subject.

39,828. You do not think that it is easier to finance one body, the Government of India, than seven or eight Provincial Governments?—The Imperial Government should have less and less to do with matters which can be administered within the Province. There is no particular advantage in the Imperial Government retaining institutes of science under its control. All the grants to these institutes should be made generally by the Provincial Governments. The Provincial contributions are being remitted and Provincial Governments ought to be able to find all that is necessary to make them first class institutions in their own Provinces.

39,829. And you are not afraid of extravagance through any overlapping or duplication of expenditure?—I do not see why it should not be easy to avoid it because the problems to be taken up are known.

39,830. Would you have some co-ordinating or supervising agent at the top to see that it was not extravagant?—I do not think that it is necessary to have a supervising staff at the top. I should leave it to the Faculties of Science to appoint an executive committee or a body of their own for guiding research, for seeing that there is no overlapping and no extravagance.

39,831. *Professor Gangulee*: An all-India executive committee?—Yes; the Faculties of the different Universities might appoint one, just as you have the Indian Science Congress which meets every year. They may be asked to appoint a committee from the Faculties and these gentlemen should constitute the executive committee for research work. My idea is to enlist the enthusiasm of all workers in science throughout the country in the cause of research. That is more likely to be brought and secured by enlisting the services of the Professors in the different Universities than by having one man at the top to guide. I would also invite distinguished experts from England and other countries, if necessary, to help and guide and encourage the research; but the administration of the thing should not be entrusted to one central officer.

39,832. *Sir Henry Lawrence*: Would you form a committee representative of all the Universities of India?—Yes, a central committee for research.

39,833. For all scientific research or specificially agricultural research?—It should be for all scientific research, but certainly for agricultural research.

39,834. You say there has been some precedent for that in the Science Congress?—Yes; the Science Congress meets every year. They place the work that each man has done before the Congress and it is giving a great stimulus to research work.

39,835. Could you tell us how this Science Congress is called together and whom it consists of?—There are a number of scientific men who are members of the Congress; they belong to different Universities.

39,836. Elected by the Universities?—I do not remember whether they are elected, but there is a membership subscription and anybody who wishes to join it can become a member, so far as I remember. I have noted that during the last few years in which this Congress has been in existence it has stimulated a great deal of research work among the Indian Professors of Science. The junior men as well as the senior men have been stirred up to work since the congress began to meet.

39,837. Who presides over it?—Every year some gentleman of eminence is selected. For instance, Dr. Forster presided at Benares two years ago.

39,838. Has there been a meeting this year?—Yes, at Lahore, and Dr. Jagadish Bose presided over it.

39,839. Is there any standing committee or secretary?—They have a standing committee, an executive committee, and they have a secretary. They carry on the work of the congress. For instance members are invited to send in information as to what papers they wish to read, what subjects they wish to discuss, and the executive committee decides what subjects should be taken up for discussion and what papers should be read at the conference, what subjects should be published and so on.

39,840. You say the importance of agriculture in India is not fully realised either by the bulk of the officers of Government or by the people. Do you think that there is any increasing realisation by the people of the importance of agriculture in India?—To my mind, not a conscious and satisfactory realisation: those who are engaged in it carry it on as they would carry on their normal business. They have not got a sufficient knowledge of the great possibilities of agriculture, of what scientific agriculture can do. I feel myself that a great deal of propaganda work should be carried on to bring home to the people the great possibilities of scientific agriculture.

39,841. You yourself have been preaching this for many years?—Yes.

39,842. Are you a landowner or an agriculturist?—No, I do not own a single acre of land.

39,843. It is merely the result of your general observation that has made you so enthusiastic?—Yes, I have moved among the people in villages and

towns, and somehow or other I began to take an interest in agriculture long ago.

39,844. Do you think that from the political point of view there will be any difficulty in securing the necessary funds for improvement in demonstration, research and in other directions, for which large sums of money would be required?—I think the Assembly and the Councils will gladly vote funds for this purpose, if the Government take up the matter in right earnest.

39,845. Do you think that the necessity for spending money in this direction is realised now by the political representatives of the people?—I cannot speak for all, but I know that some members are very keen about it; and I feel that a greater realisation can be brought about by giving them information as to what agriculture has achieved in other countries and what it can achieve here. My fear is that there is not as widespread a knowledge about what scientific agriculture has done in other countries and what can be done in this country, as there ought to be.

39,846. You think that that knowledge can be disseminated chiefly through the medium of the Universities?—The Universities will be very important centres for disseminating that knowledge. I should like to see Universities, colleges and schools all working in that direction. At present, I want to create an idea in the minds of the people that this is a most important department which requires particular attention, that this is where we get all our food and wealth from. That idea is not sufficiently realised.

39,847. *Professor Gangulee*: Who is going to do this propaganda? Will it be the Provincial or the Central Government?—If you leave that to be done by either the Provincial or the Central Government, it may be done through them; but I think the best centres are the Universities and the schools all over the country. I would make every school in the country a centre for instruction and from which these ideas can be propagated. I have suggested the formation of an agricultural and industrial association for the whole country and I think that such associations should be started with branches in every district. I want to have regular propaganda to convey the correct ideas about agriculture to the people and I want to do it as a regular system.

39,848. *Sir Henry Lawrence*: You end your note by suggesting that a Royal Agricultural and Industrial Institute should be created, with His Majesty the King Emperor as its Grand Patron and His Excellency the Viceroy and the Ruling Princes of India as Patrons and its branches established in every district in India. That is one of your chief constructive suggestions?—I want the cultivator to be respected much more than he is respected at present. I am sorry to say that he is not sufficiently respected. I want that a man who is a good cultivator should be respected as much as a pleader or doctor because I think he contributes to the national wealth, and I also want that this Institute which I have suggested should be the means of elevating the status of the cultivators.

39,849. That is a very laudable object indeed and requires propaganda on a very large scale?—Yes, it requires that there shall be a very clear realisation by those who are responsible for carrying on the Government of the country and also by leaders of public opinion, of the importance of the subject. At Darbars we see a great number of zamindars, public servants, policemen, and other officers; I should like to see a large number of the representatives of the tenants invited to such Darbars and I want them to feel that they are quite as good and as honourable as any other men. At present they are looked down upon. The policeman, the tehsildar's peons, the zamindar's peons all look down upon them; in fact they are treated like footballs, kicked about like footballs. I want that they should be treated as honest fellow men who do well in tilling and undergoing all such hardships in order to feed the country, to support the Government; and we owe a debt of gratitude to them.

39,850. How would you bring this about?—By starting an association in every district, in every *tehsil*, by getting officials of Government, the zamindars of the district and other important men of light and leading, to meet from time to time at these associations, to hear lectures, to see magic lantern shows, to obtain literature regarding the progress of agriculture in their own district and in other countries. The school and the college can do a good deal with these monthly meetings of all respectable prominent men of the district or *tehsil* in order to consider subjects relating to agriculture, in order to promote the welfare of the agriculturists; all these things will help to put these ideas into fruition.

39,851. Would you establish an official order of merit in agriculture?—I have not thought of that; but I think that the agriculturists would consider it a great honour to be invited to important assemblies or Darbars, and that would be quite sufficient to raise their prestige.

39,852. You do not think that the agriculturist would like to have a red or blue ribbon round his neck?—There are people who like it and there are others who do not. I do not want them to be bribed into good work. I want them to earn their reward for good work not by the award of titles or *sanads*, but by the appreciation of their fellow countrymen. I am not opposed to awards being given to them. I have not thought of that. If I may put it shortly, at present I feel that the cultivator is not treated with that respect and consideration with which he should be, and consequently he himself thinks that he belongs to a humble status. I want that he should feel that he is quite as good as and as honourable a worker in the country's cause as any other man. He is a most industrious and honest worker and he ought to receive recognition and consideration as such.

39,853. Are you going back to the system of Manu or are you going to improve upon it?—If we can go back to Manu's system, that would be a wonderful thing. But I would take what Manu has given us and what modern science has given us; I would combine both.

39,854. In your note you compare the progress of education, general elementary and agricultural education in India with that in Japan? But the figures which you quote will not go very far?—I am sorry I had not the latest figures when I sent in the note. The agricultural schools that they had in 1922 were: 115, A class; 209, B class; 10,791 C class. The classes are divided according to the ages of the pupils. Students from the age of 14 to 17 are put into the middle schools. Of such there were 115 schools having 1,385 teachers, 22,950 pupils and 6,776 graduates. The higher elementary school was of the next grade. There were 209 schools, with 1,186 teachers, 25,920 pupils and 8,224 graduates. Then there were continuation of supplementary schools for boys of 12 to 13 years or even older boys. There were 10,791 schools with 2,537 teachers, 662,778 pupils and 166,548 graduates. These were agricultural schools. There were also technical schools which were quite separate from these agricultural schools.

39,855. I gather from your suggestion that in India very little has been done to improve primary education in recent years as compared with Japan?—Yes, for instance I am sorry to find from the Educational Report that there are 151 schools with 8,596 pupils. This compares very unfavourably with what we find in Japan, where there are 346 technical and industrial schools with 20,045 scholars.

39,856. I find it a little difficult to follow these figures in your note as showing any very considerable work being done in Japan? Take the figure of expenditure for instance; the Government subsidy is £15,000?—You will note that that was in 1906.

39,857. And you have got later figures?—Yes, I have not brought these later figures which show the expenditure. But my object in drawing attention to the system was that the system in Japan appealed to me. It was

not done with the intention of comparing the exact amount spent there and here, but just to invite the attention of the Commission to the system that they introduced.

39,858. Then you lay stress on the fact that it is essentially necessary that a system of compulsory primary education should be introduced as early as may be practicable in every part of British India. What progress has been made in your own Province? Have you any compulsory education yet?—An Act has been passed by the Provincial Council but that was brought about very recently, and I cannot say what action has been taken.

39,859. When was it passed?—Last year or the year before that.

39,860. And you do not know whether it has been actually enforced?—I have no information about the action taken with regard to it.

39,861. Do you know if that Act places it in the power of the District Boards to apply for grants and introduce compulsion?—Yes.

39,862. Is there no enthusiasm on the part of the District Local Boards to take advantage of this power?—I have not had the time yet to notice that. They have been busy with the elections and I suppose now that the elections are over they will indicate their desire as to their future plans and I think myself that there will be a great deal of keenness displayed hereafter. It is all a question of funds. If funds are forthcoming I have no doubt that the Boards will wish to introduce compulsion.

39,863. In order to introduce it they will have to tax themselves?—Yes, that is true.

39,864. And that is likely to diminish their enthusiasm?—That is the case everywhere unfortunately, but it cannot be helped.

39,865. In spite of that, you think they will take advantage of the power they now have?—Yes, I hope they will.

39,866. *Mr. Kamat*: The Talukdars of your Province have the capacity to pay?—They do make voluntary contributions, if that is what you mean. But as to the payment of taxes, the tax will have to be paid whether they like it or not.

39,867. *Professor Gangulee*: What is the attitude of the villagers towards compulsory education?—Many of them will be in favour of it, some will not. Just turn to England and think of the fears entertained by some people there. They think that if you impart a little education to the humble man in the street, he will change his ideas and will not be easily amenable to discipline, and so on. But the bulk of the people are in favour of it; the time has gone by when considerations of whether particular sets of individuals are in favour of primary education or not should be noticed.

39,868. *Sir Henry Lawrence*: Do they exercise any controlling power inside the Local Boards?—Yes, they are well represented on the District Boards and in the Legislative Councils.

39,869. If there was opposition that would be serious?—I do not think that there will be any serious opposition. There may be a few individuals here and there who will disapprove of it, but I can vouch for the whole body of them, and say that they will not oppose it. That is my belief.

39,870. In another passage you say that people should be encouraged to form societies for co-operative production and marketing, for effecting improvements in their villages and carrying out objects of common concern, for the use of agricultural machinery, for cattle breeding, for crushing of bones for manure, &c. You are acquainted with the recent developments of the co-operative credit movement in the Provinces?—Yes, generally.

39,871. We have had a certain witness before us who said that it has not been successful in so far as banking is concerned?—There are reasons

for that. The system requires to be revised. At present the great need of the situation, so far as the rural population is concerned, is to adopt a system which will appeal to them and which will inspire confidence in them. The movement must be made more popular than it is at present, and that cannot be done by merely starting banks or co-operative societies, but by educating the people about its working, finding out what complaints they have and remedying them.

39,872. Is that education proceeding? Is there any general feeling amongst influential gentlemen that co-operation is desirable and should be fostered?—It is of a very general and vague kind; there is not a living conscious feeling that this is a work to be done; that is what is wanted.

39,873. There are not many workers in the field?—There are some workers who have done good work in the Province; there are many who have been connected with the co-operative societies who have done good work in their own way, but there is not that feeling of something like a religious enthusiasm for the cause.

39,874. Is there any institution in your Province corresponding to the Servants of India Society?—Yes, there is a branch of that society and of the Social Service League; but there is no institution at present working consciously to promote ideas of co-operation to the extent to which it should be promoted, so far as I know; there should be such an institution. I believe much more progress could be made if there were more propaganda work.

39,875. Do you think these societies can advance until banking has been put on a satisfactory basis?—They can, even as things stand at present. Take for instance, the export of bones; I see bones going out from almost every station; if the people were instructed as to the advantage to be derived from the use of bones, and if they were helped to start a bone crushing factory, I do not think they would hesitate to co-operate in the matter. I do not like to see the bones of any district going out of that district when they can be used in that district.

39,876. Are there any companies being formed in your Province to crush bones and deal with them?—I have no information. There is also an enormous quantity of hides being exported which ought to be tanned in the village; the village cultivator should be taught to tan the hides and make shoes and other leather articles in the village, which will give employment.

39,877. I have heard that Mr. Gandhi preaches that very strongly, but has he many supporters in that view?—He is gathering supporters.

39,878. In your Province?—In my Province also there are many men who follow him; there are a very large number of people who respect him.

39,879. They respect him no doubt, but will they tan hides at his bidding? —Yes, there are Brahmins who have tanned hides; there are Brahmins who took it up at Agra many years ago, and there are others; there is Mr. Wohtan who was employed in Rewah in the tanning department; he is a Kashmiri Brahmin. The feeling that at one time existed against taking up these trades has very much died out.

39,880. *Mr. Calvert*: Amongst Hindus?—Yes, amongst Hindus; amongst men of the highest caste.

39,881. *Sir Henry Lawrence*: So that you feel the time has come when these societies should be established, and you are hopeful that they will work effectively?—Yes. Two days ago a gentleman told me that in one village some of the Chamars refused to deal with a carcass, and he found it led to a great deal of quarrelling. Then this gentleman told me he got his volunteers to do the work, and later on the Chamars who used to deal with these dead bodies came and said, "We shall do it." So that volunteers are prepared to take up the work which the Chamars will not do.

39,882. *Mr. Kamat*: Is not the man who teaches tanning at the Cawnpore Technological Institute a high caste Brahmin? I am referring to Mr. Hudlikar?—Yes, he is.

39,883. *Sir Henry Lawrence*: And at Bombay?—Yes.

39,884. *Sir James MacKenna*: You lay very great emphasis on the University connection with agricultural research and teaching?—Yes.

39,885. The principal reason I think being the University atmosphere which is thus created?—Yes.

39,886. At this stage I should like to say how much the Members of the Commission enjoyed their visit to the Hindu University at Benares, and how much I was impressed by the very fine equipment you have got?—It was very kind of you gentlemen to visit it, and on behalf of the University I beg to thank you all.

39,887. But do not you think that is rather starting at the top; should not agricultural research start on a lower footing before it aspires to University status?—The rays of the sun strike the peaks of the mountains first. Both methods should be adopted. You might start at the University or you might start at the bottom with the primary school, but I think both lines should be followed. No man can be a good teacher unless he carries on research himself; that you, Sir James, know. Every scholar is agreed that a man to be a good and efficient teacher must continue his own studies and researches; therefore we insist upon our Assistant Professors carrying on research work; I have found that that creates enthusiasm; from the time when they commenced to take up research work, they have become changed men.

39,888. I take it that, so far as the Hindu University at Benares is concerned, your idea is to have the Faculty of Agriculture working in a separate building like the Faculty of Engineering?—Yes.

39,889. What degree do you propose to give: that of Bachelor in Agriculture or Bachelor of Science in Agriculture?—I have not discussed that matter with my Syndicate, but I do not know that there is any very strong difference of opinion on the point; we shall of course adopt the course which is most approved in other Universities.

39,890. I take it that the training in pure science, chemistry, botany, physics, and so on, could be given in the existing laboratories of the college?—Yes.

39,891. That would effect economy in working?—Yes. We are extremely well equipped in these science departments.

39,892. Have you any idea what is going to happen to these young undergraduates in agriculture when they are let loose upon a hard world?—Yes, I want to send them out to the districts where they can work with the farmers; where they cannot work with the farmers, I want them to obtain a plot of land such as has been given by Sir Malcolm Hailey's Government, on the advice, I understand, of Sir Ganga Ram; we should like them to have plots of land given to them so that they can put their knowledge to practical test.

39,893. *Professor Gangulee*: Do you mean given to them by the Government?—Yes.

39,894. On lease?—Yes.

39,895. *Sir James MacKenna*: Your University is in a peculiar position in that it has no territorial basis; it is based on your religion and, therefore, is for all India?—Yes.

39,896. So that students coming from Benares University will be scattered to all the corners of the Indian Empire?—Yes, and my idea is that

they should be found working in every *tehsil;* there should be at least one graduate of agriculture in every *tehsil.* There will, also, be a number of men who have not taken the degree course, who would be practical farmers. I want to make the village as attractive to any man as the town is, and more so, if possible.

39,897. In fact, you desire to develop rural uplift in its widest sense?—Yes, reconstruction and uplift.

39,898. Then, as far as the Hindu University is concerned, your position is quite clear. Would you carry the question of affiliation to the extent of affiliating all existing agricultural colleges to a University?—Yes, that is my idea.

39,899. Of course, there are objections to that raised on both sides; first of all, the University is apt to say, "Your standard of admission is not high enough," and then the agricultural college is apt to say, "We are not going to have other Faculties interfering and correcting our curriculum"?—But that is a matter of adjustment. The Universities must maintain a high standard; I am entirely opposed to lowering of standards for graduates; there must be a lower grade of examination for practical farmers; what that is to be is for experts to advise. Those who are to work on the land need not necessarily take a degree, a diploma will do. We have at the Benares University, in the College of Engineering, a diploma course and a degree course, and we shall institute a diploma and a degree course in agriculture. I should teach agriculture through the medium of the vernacular. They must learn English in order to derive the advantages of up-to-date information, but that should be practical knowledge; they need not be familiar with the English classics. I should be sorry to drive anybody from acquiring a knowledge of those classics, but we must attempt only that which is practicable.

39,900. That is to say, in the University there would be a vernacular course for the diploma?—Yes, and also in other colleges, English being taught as a language.

39,901. *Sir Ganga Ram*: Have you got books in the vernacular on agriculture?—Not yet; some have been prepared, I understand, but they are very few; many books on agriculture in the vernacular will have to be prepared. One donor has given Rs.50,000 to have books prepared in Hindi.

39,902. *Sir James MacKenna*: But at present, at Benares, are you giving degrees for courses of study pursued in the vernacular?—No, no English degree is given to a student who does not read through the medium of English.

39,903. With regard to Pusa, do you think that on account of its isolated position and its having grown up as a separate institution, the question of affiliation to a University need not be pursued? Would you leave it as it is?—I wish the question to be considered as to how the staff of the Pusa Institute could be made more available to help existing Universities, whether in Bihar or Benares. I do not wish to wind up Pusa; it is a beautiful place and very well equipped; I should like the services of the scholars there to be made more available to students. I do not confine that to Benares and Bihar; it might include Lahore, for instance.

39,904. You feel that the staff at Pusa might be made available for any college or University in which agricultural research was studied?—Yes; the advantage would be that the research worker, being in touch with a large number of students, would be able to pick up the most promising students for research work; that would be one very distinct advantage.

39,905. The position is, that you would like to have an interchange of research staff between Pusa and the colleges in other parts of India for

their mutual advantage?—Yes; unfortunately, the Universities are not so well equipped with staff as to be able to spare many men at present; but occasionally we could send men to study particular subjects.

39,906. I want to put one general question to you as a prominent political leader: What is your view as to the selection of men for scientific research? Would you be limited by considerations of nationality or would you look for the best men on the particular subject?—Does science make any distinction between man and man on the ground of race or creed? It does not, and so in scientific discussion considerations of race should be shut out.

39,907. You want the best man?—I consider it almost unthinkable that any man who loves science should allow any considerations of race to count; we honour men of science wherever they come from.

39,908. *Professor Gangulee*: You suggest there should be a Faculty of Agriculture in every University?—Yes.

39,909. In the United Provinces you have Lucknow University, Allahabad, Aligarh and Benares?—Yes.

39,910. Would you have four Faculties in one Province?—If they can find students and can equip themselves; the Faculties will not be started by every University at once, but a University that desires to start a Faculty of Agriculture ought to be helped to do so. I want a number of young men to be diverted from the study of law to agriculture and commerce; I think it is almost a crime that these young men are not given some other interest than that of law.

39,911. *Sir Ganga Ram*: And yet you established a Faculty of Law before a Faculty of Agriculture?—Yes, unfortunately, because it did not cost us anything; I was opposed to it for a long time.

39,912. *Professor Gangulee*: You are in favour of affiliating, for instance, Cawnpore Agricultural College to the University of Agra or the University of Allahabad?—Yes; I should prefer the University of Allahabad because that University is well equipped in science; all its scientific departments are extremely well equipped.

39,913. Your idea is that the recognition of agriculture as a teaching subject by the University would attract students?—Yes.

39,914. You desire to see research concentrated in the University; would not you give the Provincial Departments of Agriculture any opportunities for conducting research?—No, the men who want to conduct research should be at the University, that is the place for them. If a Provincial Government has already got facilities for research, I should not object to those facilities being used; I do not wish such equipment to be scrapped; but every capable man who can carry on research ought to be attached to some University, so that the benefit of his knowledge may be given to students.

39,915. When you say attached to the University, have you in your mind that the research should be carried on in some particular locality, or do you mean that the research institution should merely be affiliated to a University?—If an institution exists, such as at Cawnpore, some work must be carried on at the farm; so far as laboratory work is concerned, it can be carried on as well at the farm as at Allahabad University, if it is affiliated to that University. That will depend upon the stage of development that the institution has reached. If an institution is fully equipped for research and investigation, that research and investigation can be carried on on the spot, but, to my mind, such research will always suffer by reason of its isolation.

39,916. In these Universities, I take it, you would only give the degree of Bachelor of Science in Agriculture?—Yes, and Master of Science later on.

39,917. Anybody who desired to pursue his agricultural education further would be trained at Pusa; is that your idea?—If Pusa offers greater advantages than we provide at Benares, certainly; but I have suggested that the best men at Pusa should be available at Benares to help my students there.

39,918. That could be done by frequent meetings and so on. There is one very interesting point that you raised in discussing the subject of scientific and industrial research; you referred to the Committee of the Privy Council; you said the first thing necessary was a large supply of competent research workers, the second thing being a hearty spirit of co-operation among men of science, men of business, working men, professional men, scientific societies, universities, technical colleges, and so on. Have you any definite suggestion as to how this could be brought about in India?—Just as it has been brought about in England; every man interested knows that this work is going on at a particular centre; he sends his suggestions and he asks for information from that centre.

39,919. There must be a co-ordinating agency somewhere; who is going to bring all these elements together?—The institution itself will be the centre for co-ordination. For instance, if the University of Calcutta is carrying on agricultural research on cotton or any particular subject, those who are interested in that subject will know it; they can become members of the institute, they can join the association, attend annual exhibitions or demonstrations and keep themselves in touch with it.

39,920. But you want to bring together business and professional men and others interested in your research work?—They will be led to take interest in it if they know of the work that is going on; there should be a system of making them associates or members of an institute for this work so that they will get periodical information as to the progress of the work.

39,921. That is to say, you must have some organisation to co-ordinate various activities in different parts of the country?—To bring these various individuals and bodies into touch with each other; where many Universities exist they will all become centres for such organisation.

39,922. Are you familiar with Cawnpore Agricultural College?—I have seen it.

39,923. Do you know intimately any of the men turned out from that college?—I cannot say I know any intimately.

39,924. We are told that graduates turned out from the agricultural colleges are not efficiently trained nor sufficiently interested; what is your view?—That has been the complaint about the Cawnpore College. The men who have been turned out have been employed as *kanungos*. It is a lower standard; they did not make it a University standard. If it came to the University we would have a University standard, though the farmers' standard will be a lower standard.

39,925. Referring to schools in Japan, I think they have got the special agricultural schools in every Prefect. Do you think our District Boards have taken adequate interest in agricultural education?—No, but they have not been instructed how to take interest; you have not sufficiently instructed them about the need of it; they should be instructed or educated about it.

39,926. They are all controlled by educated men?—That is not the point; it has not been anybody's business, generally speaking (I do not mean to belittle the good work that has been done), to make agricultural education understood by these people in the way in which you want it to be understood by them.

39,927. Returning to the question of compulsory primary education, do you think public opinion in this country is quite prepared to have that?—I think the bulk of the people will support it.

39,928. Even if it is necessary to have an education cess?—That has to come in its own time; you cannot have fruits without paying for them.

39,929. On page 709 you say: "the small tiller of the soil is still not provided with a sufficiency of the necessaries of life." You have known rural life for a long time and you come into intimate contact with these people. Is the standard of living increasing or decreasing? What is your general impression?—There are two ways of judging it. One is to see whether they have some of the articles of modern manufacture in their homes; the other is to see whether they are healthy, whether their children are strong and able to work and live. The first standard is satisfied in some cases. You will find articles of modern manufacture in some places. That does not show that the standard of living has risen in its true sense. So far as food and raiment are concerned, I find the physique of these people is deteriorating. Even in the Punjab where the condition of the agriculturist is much better than that of the peasant in the other Provinces, so far as I am aware the cultivators are not as strong now as they used to be.

39,930. Is that due to lack of nutrition or lack of knowledge?—For instance, in the Punjab they used to have plenty of milk in days gone by and they cannot have it now.

39,931. We are told that in the Punjab we have abundance of wheat?—Yes, they have wheat and *dal*, but they have not the milk; they are fond of *lussi*.

39,932. You state that the tillers of the soil do not receive adequate recognition. Why? Is there something wrong in the national psychology?—It is a vicious system that has grown up. They have been regarded as humble men always, to bow before the zamindar or the official and to be humble men. If they look direct in the face when they are talking to a zamindar or an official they will be considered impertinent. They are considered to be humble people, *chota admis*. I think they should develop a sense of self-respect and self-reliance and regard themselves as men of dignity.

39,933. Do you think the religious and social outlook of the intelligentsia is partly responsible for this?—It may be in some instances and to some extent, but the question is not affected by that entirely. Largely it is a question of the notions that have come down and these notions are not confined to this country. In other countries too the peasant was regarded as a very humble man, in England, America and elsewhere. It is the education that he has received and the progress he has made that has brought him recognition, and so it will be in India also.

39,934. He is able to assert his rights only when he is educated?—Others have helped him to understand his rights and assert them. When the Reform Bill was passed in 1868 they said "educate our masters," so that they began to educate their masters in 1870, and since education made progress, it is the men at the top who inspired the others that they were equal in self-respect to the others, and the influence of the teaching of the Bible undoubtedly prepared the way for it to a large extent. Here if you give education to the people, I do not think there will be any difficulty in creating the same kind of attitude among them both at the top and at the bottom.

39,935. Turning to another point raised by you; you say that the first requisite is that the cultivators must get a larger share in the fruits of their industry; and that the first condition necessary is to reduce the burden on the land?—That is to say the share that the cultivator has to contribute should be reduced.

39,936. That is his land revenue?—The rent that he has to pay.

39,937. Do you think that reduction in the land revenue is necessary, that it is excessive?—I do not wish to go into that question. I only wish the cultivator or the tenant to have a larger share of the profits of his industry left to him. It is a very difficult question and I am not prepared to go into the details at present.

39,938. In your universal free and compulsory primary education, would you include girls' education?—Not compulsory education. But girls are willing to go to the schools and if you provide girls' schools there will not be any difficulty in promoting their education.

39,939. I see you lay a great deal of stress on free pasture land; but as you know with the rise of population and extension of agriculture it may be necessary to utilise every bit of land that you can get for cropping?—It is a very short-sighted policy.

39,940. Do you think stallfeeding would in any way solve the problem, as it has done in other countries?—My idea of having pasture land is this. I want that the milk which people get from the cows and buffaloes should be the purest and that milk you cannot get on the stall system. If the cattle graze on the pasture land they will give better milk than on the stall system.

39,941. Are you familiar with the work of the Royal Agricultural Society in England?—No.

39,942. That Society was started practically with the same object that you suggest here; the King is the patron and a large number of influential men are associated with that Society. Do you think the time has come for starting such a society in this country?—Undoubtedly.

39,943. Do you think it will receive adequate recognition from the people who, you mention, ought to be the members?—Certainly.

39,944. In England the Society has a certain amount of finance either from donations or from other private sources. Do you think such financial assistance would be forthcoming in this country?—Yes.

39,945. From the Government?—Both from the Government and the public.

39,946. It would be an organisation consisting of officials and non-officials?—Yes.

39,947. And it would have its branches in the Provinces?—In every district.

39,948. The men working in connection with this institution would be paid men?—Some of them would be paid men and others would be honorary workers; I would have officials and non-officials.

39,949. You must have at least one paid Secretary for each district?—Certainly, one paid graduate Secretary.

39,950. It would involve a large expenditure?—But the money would come; the Government and the public would find the money; the object is important.

39,951. *Mr. Calvert*: You refer to the habitual starvation of a number of people. The evidence given before us suggests that this starvation is not so much due to the lack of quantity of food as to the lack of the essential vitamins?—Yes.

39,952. Further evidence goes to show that a whole wheat diet is much cheaper than the rice diet which leads to all these diseases?—Yes.

39,953. So it is a question of the lack of knowledge of diet?—Partly it may be so; but it is also lack of ability to purchase a nutritious diet.

39,954. It is also as much due to the old prejudice against certain types of food?—It is not prejudice; it is the predilection of the people in some

parts in favour of certain articles. For instance, they are in favour of rice in Bengal. I am entirely at one with the idea that there should be a knowledge of the nutritious value of the foods, a propaganda among the people.

39,955. Eggs are full of vitamins, but certain people will not eat them?—They are certainly not meant to be eaten; they are for a more useful purpose. By eating them you are not allowing the birds to grow out of them.

39,956. Would you stop that sort of diet?—I would ask my brethren to give it up. I am happy with my milk and butter and I do not think there is anyone who is happier than I am with my food; nor is it less nutritious.

39,957. There is a certain amount of sentiment against certain articles of diet which might be nutritious?—It is not a question of sentiment now. You have got a scientific man, Dr. Haig of London, who has proved that a meat diet is not good for man and that wheat and milk constitute the most nutritious diet.

39,958. *Sir Ganga Ram*: I think he has also included eggs?—No.

39,959. *Mr. Calvert*: Are you acquainted with the investigation which is being carried out in Coonoor by Colonel McCarrison into the diseases due to malnutrition?—I am not aware of that. But I can tell you that a number of experiments were made at Calcutta by Dr. Nilratan Sirkar and others on a number of pigeons. A certain number of them were fed on a rice and *dal* diet and others were fed on a wheat diet, the Hindustan diet. Those that were kept on the wheat diet flourished and thrived very well and were happy and those that were kept on rice diet faded and became ill. The result of the experiments was a verdict in favour of the wheat diet.

39,960. But the rice they were fed on was polished rice?—That was a factor to be taken into account. I am told that unpolished rice is better and I certainly think it should be better.

39,961. Probably it is not quite so simple as that. As you suggest, the Punjab is more prosperous than other parts of India and it has a high death rate?—It is due to the want of sanitation arrangements; otherwise it should have a much lower death rate.

39,962. The temperature is rather pleasant to certain classes of bacteria?—It is a question of sanitation.

39,963. I think you have corrected a little slip of yours, that a reduction of land revenue would benefit the cultivator. The land revenue is payable by the landlord?—I have said that the reduction should be secured to the benefit of the tenant. That is what Mr. O'Connor said.

39,964. Do you accept the figure given to us that the land revenue in the United Provinces is only 2 per cent. of the gross produce?—I will accept it if that has been given to you by any official authority. I have not got the figure with me at present.

39,965. It is a little difficult to get below 2 per cent.?—My point is this: I judge from the result; I judge the tree from the fruit; I find that in the United Provinces a large number of tenants are in a very very miserable condition. If you go to the eastern districts, you will see it. They have not got any clothing on their bodies; their children are running naked in the winter; the people work early in the morning with a little rag on their bodies; they have not got enough clothing to cover themselves at nights. This is the condition of a large number of these tenants. I wish to see this condition improved, and I consider that if a little more of the fruit of their industry were left to them, this result is likely to be achieved.

39,966. You are thinking of rent?—Yes.

39,967. You put the figure for the children of school-going age attending school at 6·05 per cent.?—Yes.

39,968. Are you quite sure of this figure? The figure for the Punjab is 50 per cent?—I have taken it from the last year's report of the Government of India.

39,969. Does not the figure 6·05 refer to the total population? The Punjab figure is 8·44 per cent. of the male population, and that comes to 50 per cent. of the population of school-going age. I think it is a slip?—It may be.

39,970. You have mentioned Japan several times; Japan, to a large extent, is a Buddhist country, and in Buddhist countries like Burma and Ceylon there is distinctly that tendency in favour of literacy. Can you account for that?—You create more schools and you will find that tendency. Japan has gone ahead because of the modern system of education.

39,971. Of course there is no dispute now about primary education. It is more a question of ways and means?—Yes.

39,972. You have made some remarks about land revenue or rent in India; but are you aware that in Japan the land revenue is about three times that in India per acre?—I am not aware of that, but it does not affect the question here.

39,973. Japan takes 17 per cent. of the gross produce and it is able to provide funds for educational and other improvements?—I do not object to your taking even 27 per cent. if you leave sufficient to the cultivator. It is all a question of what he can bear. If you take even more from the tenant, I do not mind it so long as you leave sufficient to him to live healthily.

39,974. But you admit the difficulty due to the enormous extra taxation which you may require?—Taxation will be required, but taxation has to be borne when there is a clear-cut object to which it is to be applied.

39,975. You agree with some other witness whom we have heard that we might extend compulsion much more rapidly than we are doing?—Certainly, it ought to be extended. According to the figures I gave you, the Educational Commissioner with the Government of India remarked that it would take forty years to get all these boys to go to the schools.

39,976. In the Punjab we reckon five years. With regard to these village industries, a certain amount of evidence has been placed before us to the effect that one of the main difficulties in the way of promoting village industries is that there is a prejudice against poultry keeping and certain other callings, these callings being regarded as the work of menials, and therefore the ordinary cultivator will not touch them? Do you agree with that?—There is a prejudice against certain kinds of work, but they are not the only kinds of work which should be selected. You have to see which particular kind of work will be suited to different individuals. Poultry-keeping will be resented by certain classes of people.

39,977. Even sericulture?—There are two kinds of sericulture. For instance, that connected with the rearing of cocoons is encouraged; there is no prejudice against that; it is called *muktar*, and the cocoon dies in the process. But in the case of the one in which the cocoon has to be killed, there is a prejudice; but that is a small matter.

39,978. There are difficulties in the way of Government introducing these industries?—What are the difficulties?

39,979. Sentimental ideas and things of that sort?—Where there is any sentiment against a particular industry, that need not be forced upon the people; it should be a matter of choice. There is such a variety of choice available that there should be no difficulty in the way of any particular industry.

39,980. Then you would like to see industrial schools established. Would you refer us to any example of a successful industrial school in India?—I saw one at Bareilly; there is another at Lucknow and a weaving school at Benares. Both the schools at Lucknow and Benares have got on well. I have not seen the Bareilly school for some years, and I do not know what the condition of that school is now. Then there is one at Gorakhpur. But the system is not satisfactory. You want to create an enthusiasm for this class of schools among the population. If you once do that you will get a large number of students to go to them.

39,981. You hark back again to the old idea of agricultural banks. Could you point to any successful agricultural bank anywhere in the world?—I have read of many successful banks being in existence in Japan.

39,982. Non-co-operative agricultural banks?—They are described as agricultural banks, I think, which give two kinds of credit, the long-term and the short-term credit; long-term credit for purchasing farm land or improving the farms, and short-term credit for purchasing manure, cattle, and so on.

39,983. Are they not co-operative banks?—I do not think that they say they are co-operative banks; at any rate, Japan's latest book does not say that.

39,984. What is your idea? Is it that Government should produce the money for the agricultural banks?—I cannot answer that question. A scheme has to be devised and Government will partly contribute towards it and the people will also put in their money.

39,985. You refer to the Wedderburn scheme. Under that scheme the Government found the money?—Yes, in Japan the Government find the money; the Imperial Bank in India is being assisted by the Government. The Government should certainly help.

39,986. You have devised a scheme according to which the people will be willing to invest their money in the banks. The difference between your agricultural banks and the present *taccavi* system would be that your bank would be under non-official control whereas the *taccavi* loans would be under Government?—Yes, but they will be supervised by Government auditors, to prevent any wrong paths being taken.

39,987. I suppose you know that attempts with the non-co-operative agricultural banks in Europe have mostly failed; the Egyptian one failed?—I am not up to date with information regarding the failure of these banks; but banks have sometimes failed. In this country many banks started during the last 100 years have failed.

39,988. One witness has warned us against the idea of providing agricultural credit by non-co-operative means, such as through the Agricultural Bank of Egypt. I was wondering whether you have had any experience of any agricultural banks on which you base your views?—My point is that you must create agricultural banks in order to make credit available to these cultivators both for long-term as well as short-term purposes; whether you call them agricultural banks or anything else, it does not matter. I have put forward the suggestion of agricultural banks because it is necessary that these agriculturists should be helped to obtain credit whenever they want it. I will give you an instance to illustrate my point. Here in the month of March, the tenants have to pay their rent because the revenue has to be paid on a certain date. They have to borrow money at very high interest in order to pay their rent. The rigidity of the demand for the land revenue is such that they have to borrow the money. If there was a bank which would advance on easy terms the money necessary for the agriculturist to pay the Government rent, it would relieve him to a very great extent. At present he has to

pay a high rate of interest because there is no bank to which he could go. I want that there should be banks provided which will advance money to the agriculturists whenever they need it, on reasonable terms of interest.

39,989. Have you not heard that the Imperial Bank have agreed to give seasonal loans?—That does not even touch the fringe of the problem which I am putting before the Commission. The question is really whether the agriculturists will be willing to borrow money from the Imperial Bank. They have to consider so many circumstances; the agriculturist has to see whether by borrowing from the Imperial Bank, he will be able to tide over his difficulties.

39,990. On the question of pastures, is it your argument that an acre of waste produces more cattle food than an acre of cultivation?—Do you seriously put that question?

39,991. You argue in favour of free pastures?—If you have cultivable land, it is still necessary that you should have pastures in order that the cow may graze there and give you milk. Milk is a perfect food, and if the cow gives you good milk, why should not you have it? You have to pay for the milk in the bazaar; why not pay for it in the shape of good cultivable land? It is only a question of how you pay for it, whether you pay for it in cash or pay for it by reserving good cultivable land for pasture.

39,992. You think that the free pasture land which is so common round about Delhi does give a certain amount of cattle food?—Yes.

39,993. Is that in any way profitable for the cattle?—That is a question to be considered; if the land were cultivated it would certainly produce a large amount of food. The question is, if the land is available for pasture, it should be made available for cattle grazing; and there is a large amount of land available in the country. It is all a question of organisation.

39,994. The evidence which we have had before us so far shows that the pasture land is merely exercising ground: it practically contains no food? —If you want a rose you must grow a plant; if you want to get good grazing grass for your cattle you must cultivate it.

39,995. You have helped to pass through the Assembly the Usurious Loans Act?—Did I?

39,996. Wherever we have been we found that Act a dead letter. Can you explain the reason?—I am sorry you do not remember my speech; I urged the very thing there, namely, that you should supply more credit to the agriculturists on cheap terms; I quoted Sir Daniel Hamilton in that speech, and I also read that portion to-day before the Commission My contention has been that Government should make cheap credit available to the creditor and they should multiply these co-operative societies and institute agricultural banks in order to make such credit available to the cultivator, who has to pay high rates of interest because he cannot help it. I was never in favour of usury. I consider that no one should be asked to pay more than 6 per cent.

39,997. Why is this Usurious Loans Act such a dead letter?—I have no information about the working of it; you know more about it.

39,998. I am afraid I have put this question everywhere else and I have always drawn a blank answer?—The unfortunate part of the thing is that the reports are not circulated to us; unless they are published and the people are in a position to make a special study of the question they will not be able to give you any useful information.

39,999. *Mr. Kamat:* While describing the condition of the peasant a little while ago, you said that he had no clothes to wear and not enough

food, and you drew the inference that probably the land revenue system was responsible for all this?—Yes.

40,000. On the other hand, we have been told that perhaps the outturn per acre of recent years has not gone down and the prices which the peasant is getting owing to the world factors have gone up, with the result that, although he gets the money for his needs, he does not know how to spend it?—Has he not to buy? Has he merely to sell?

40,001. I am just asking for your view in the matter? If he is getting more money for his crops now than he used to get, what is he doing with it?—The prices have gone up, and while he gets a higher price for his commodities, there are other commodities which he has to buy and for which he has to pay equally high prices, so that the residue which is left to him is not enough to maintain him and his family. Is it conceivable that any human being would not give himself and his wife and children sufficient food and clothing if he had the means to do so? I have found a lot of people with sunken eyes, emaciated bodies, people looking dreadfully poverty-stricken, and their physical condition is such that they are readily susceptible to disease. I cannot imagine for a moment that such people deny themselves all these little necessities simply for the fun of it.

40,002. That is just the point, namely, whether the so-called extra money that goes into their hands is wasted on unnecessary things?—If that is suggested by any one it is an absolutely unjustifiable libel upon these poor cultivators. They are not given to drink, they do not drink tea, or supply themselves with other luxuries. They hardly have a square meal in 24 hours; on the other hand, if they had had a little extra money, they would immediately supply themselves with the pressing necessaries of life. To suggest that they waste their money is a distinct libel on these poor people.

40,003. *Professor Gangulee*: Do they spend any money on jewellery?—Yes, they do buy some jewellery when they have a little money; that is their only savings bank.

40,004. We saw a jeweller's shop right inside the market at Akola and we were told that whenever a cultivator obtained a little extra money out of his sales he forthwith invested it in jewellery?—Thank God that they do it; the habit has come down to them, otherwise they would be nowhere. During times of famine, of scarcity, they fall back upon this jewellery by pawning it and thus saving themselves from starvation and death.

40,005. *Mr. Kamat*: Is it also true that the peasant makes litigation a habit and therefore he is ruined?—That is another libel against him. A vakil who came to me from Lucknow said that he had instituted a case against a tenant on behalf of a talukdar. The tenant had to appear on so many occasions that from utter despair he gave up the fight by going to the Raja and saying that he would not go on with this litigation and that he would accept whatever the Raja said. This shows that these poor people are simply driven to litigation much against their will.

40,006. I suppose they are ruined through the long delays occasioned in the court?—Not merely delays in the court. The cultivator goes to the court only when he is driven to it. Of course, there may be one or two cases here and there in which they go to the court, but taking the tenants as a body, I do not think that they are fond of litigation.

40,007. You were a Member of the Industrial Commission. I should like to have your opinion on one point. You know that 70 per cent. of the population in India is engaged in agriculture and the pressure on the land is heavy. Would you like that a large portion of this population

should go into manufacturing industries?—Unless it does there is no future for India. Up to the middle of the last century Indians used to produce a large number of manufactures. Those manufactures ceased when we began to export the raw produce, and also because imports began to come into the country in large quantities. That is why these famines began to occur, and I have referred to this aspect of the question in my note. The same was the case in Ireland.

40,008. If this industrialism goes on, what will happen to the agricultural wages and agricultural industries?—If you mean to suggest that wages will rise, then I heartily agree, because the agricultural labourer is not getting sufficient at present; if the cultivator gets a little more for his labour then it is all the better for him. If the manufactures grow, the national average income will also grow.

40,009. Side by side with the improvement of agriculture you therefore want industrialisation of the country?—That is absolutely necessary. You will kindly note the recommendations of the Famine Commission of 1880, as they are very valuable. They found that one of the causes for the masses not being able to withstand the famine was that agriculture was the only occupation on which they could depend and they recommended the introduction of industries as the one remedy necessary for their salvation.

40,010. *Professor Gangulee*: There is an excessive pressure on the cultivated land?—Yes.

40,011. *Mr. Kamat*: With regard to the question of the dairying industry, we have been told that in this country animals which are old and unfit are allowed to live on pastures and thereby they consume the food which is necessary for the better type of animals, and further that that is perhaps one of the reasons why the dairy industry does not prosper and cattle improvement is also not possible. You know the prejudice and sentiment which exists in this country against the slaughter of animals. In view of that fact, is there any solution of this difficulty?—There is a great deal of ignorance on this subject. The cow calves up to the last year of her existence I am told. She goes on producing a calf year after year and if she does not give you milk she gives you a calf, which is of great value; and if she lives upon the land and grazes she gives you manure for the land; and lastly, when she dies she leaves you her hide. The man whose children have drunk of her milk should be grateful to the cow and should look after her and not send her to the butcher.

40,012. So that whatever schemes of cattle improvement or dairy work are proposed, this sentiment will have to be reckoned with?—Let me give you an instance. A small blind cow was sold to the butcher and a *brahmachari* in Benares, having seen it with the butcher, purchased it for Rs.4. It was a very small cow, and that very cow has produced two calves, both of them very powerful bulls. The younger one fights a big bull in the *gowshala*, and whenever he is able to do so he runs away, leaving the people a difficult task to get hold of him. A cow which may not be able to produce much good milk may yet produce good calves; therefore before destroying the cow all those facts should be considered and appreciated. If a cow is put to graze on a particular piece of land she will enrich the land to some extent. I am willing that she should be put to the yoke in order to plough the land to grow the grass that she has to feed upon. There are various ways of dealing with the question, and to allow the cow to go to the slaughter-house is, I submit, a very ungrateful act on the part of man.

40,013. Another matter for which we are searching a solution and which is intimately connected with the habits of the people is the question of burning cowdung cakes?—I have always regretted that cowdung should be

used as fuel; I wish with all my heart that we could teach the people to avoid using cowdung as a fuel and to use it as manure; but sufficient propaganda has not been done and there are certain difficulties that stand in the way. People do not use cowdung cakes when they can get other fuel; the remedy to my mind lies in offering a good price for the cowdung and also making cheap fuel available to the people. If those two things are worked together, I think we can prevent a great deal of this manure from being burned.

40,014. How can you cheapen fuel: by planting trees on waste lands?—Planting trees and letting the forest lands for this purpose; the Government ought to be willing to take less from the forests than at present. After all, the forests exist for the people, and the forests ought to be used to supply cheap fuel. Sir Ganga Ram proposed a great scheme for the supply of food, fodder and fuel; some years ago he suggested that scheme to the then Member for Revenue of the Government of India; that was before this Commission was thought of. Unfortunately that scheme was not then sufficiently appreciated; I hope this Commission will consider the question. There is plenty of land where grass can be grown, and there is plenty of land upon which you can grow timber for fuel.

40,015. *Sir Ganga Ram*: Do you mean outside the village? Where is this land?—In the forests, in the jungles. I think it is a pity that this fuel has become so dear; in some places in the hills, and particularly in the Himalayas, people complain bitterly of not being able to get sufficient fuel. I know that in that cold climate, people are exposed to great hardship and suffering from want of sufficient fuel.

40,016. *Professor Gangulee*: What about the villages situated at a distance from the forest areas?—That is a matter of arrangement; it can be arranged.

40,017. There is the cost of transport?—But all that is a matter of arrangement. I hope Sir Ganga Ram will put his scheme before the Commission.

40,018. *Mr. Calvert*: Did you use the word "forests" in the sense of Government forests, or in the sense of jungles?—In the sense of Government forests and jungles.

40,019. Were you referring to the plains where there are no forests?—I was referring to the Government forests primarily; I think the forest rules require to be relaxed in order to let the people have more fuel than they are able to get at present.

40,020. You were not thinking the plains of the Punjab and the United Provinces?—No, but where there are jungles they should be utilised for producing cheaper fuel; it is possible to arrange that where there are jungles. Then there are all these roadsides all over the country; it is all a question of organisation by the Government.

40,021. *Mr. Kamat*: You have emphasised the necessity of rural uplift and rural reconstruction in the villages; could the work of educating the villagers to live a good life be done by Government agency or by non-official agency or by both together?—Both together; there should be no question of this work being official or non-official; I consider that it is God's own work, and I think every man and woman who has any feeling of humanity ought to co-operate in this work.

40,022. *Sir Ganga Ram*: You have been giving a very good sermon as to the state of the tenants and so on, but may I bring to your notice one thing that I have myself observed: in Patna I visited a village of a Raja who was charging Rs.15 an acre to the tenants and was paying Government three annas; why did you not have the courage to lecture on that subject

with a view to abolishing the Permanent Settlement in the interests of the tenants?—I am not guilty of want of courage if I do not advocate every good thing in this world; if there were an occasion to vote on it after a discussion in the Legislative Assembly and I do not do so, then I should be liable to censure by you.

40,023. You said just now that the tenants are left nothing?—I did not say they are left nothing.

40,024. Well, very little indeed, and naturally on that calculation they would be left nothing?—I may say at once I am not in favour of the tenants being fleeced, whether by Government officials or by zamindars; I want both the Government and the zamindars to be more considerate towards their tenants than, unfortunately, they are.

40,025. That is the propaganda I want you to take up?—Most certainly.

40,026. Have you been exercising your influence with the big landlords of the United Provinces to make then more considerate to the tenants?—Yes; I wish I could produce them before you and ask you to question them. I have everywhere said to zamindars, and I said it even during the last elections: "If you want to work with me you must agree to be fair to the tenant; you must agree to give him his due and I will advise the tenant to give you your due." I have said it again and again, not only this year but for many years past.

40,027. There is one very important thing we are doing in the Canal Colonies; all landlords are building sanitary houses and supplying pure water to their tenants?—Yes.

40,028. Have you ever suggested that to your landlords?—I have not suggested it because I have not had occasion to, but some landlords have done so.

40,029. In the United Provinces?—In some places.

40,030. We have been told that none has done it?—Very few have, but the point is that I entirely agree with you in regretting that, generally speaking, the idea of building houses for the accommodation of tenants is not prevalent amongst the zamindars; but many of them treat their tenants with consideration and extend the help that is needed, help such as you, for instance, give your tenants. That is the right measure of help and I wish everybody would do the same.

40,031. In your University have you introduced agriculture as an optional subject for the degree of Bachelor of Arts?—Not yet because we have not got the staff to teach it.

40,032. You are going to?—Yes, I am very anxious to do so.

40,033. Without considering whether he is going to join the Agricultural College or not? I mean it should be optional and treated as being equal to botany, zoology and such subjects?—Quite so; I think agriculture should in no way be regarded as an inferior subject as compared with any of these other subjects; it should be treated as of equal value to encourage students to take it up. If students take up agriculture I think they will find it more useful in after life than some of the subjects which they now undertake and which they afterwards forget.

40,034. *Sir Thomas Middleton*: I think you have in view the immediate starting of post-graduate agricultural research in Benares University?—We can only do that when we have started the College of Agriculture. We are carrying on some post-graduate agricultural research at present, for instance, in erosion, plant physiology, questions of respiration, and as to how much water and air a plant absorbs and under what conditions; these questions are being investigated as pure science questions; but we want to establish a College of Agriculture and then to provide for research beyond the graduation stage in a special manner.

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40,035. Even before the College of Agriculture is established, is there not much that you could do in the direction in which you have already begun?—Yes, there is.

40,036. You have got your Professor of Plant Physiology and he must find many agricultural problems on which he can work?—Yes, he is dealing with some at present. In a few months one of our students is sending up a thesis on research which he has been carrying on for three years.

40,037. What funds have you at your disposal for assisting that class of post-graduate study?—Unfortunately we are very much handicapped for want of funds; we have not got enough money. We have applied to the Government of India for help, but we have not got sufficient help yet; we have again applied and we have applied to the United Provinces Government, which gives 7 to 8 lakhs to the Allahabad University and the same amount every year to the Lucknow University. The Government of India give Aligarh University 1¼ lakhs a year while they only gave us a lakh when the University was started and we had only three Faculties; now we have added many Faculties, but our grant has not been increased beyond Rs.25,000 sanctioned for two years. You can imagine what is the position of our staff when we only receive 1 lakh while other Universities receive so much more. Our staff is working on salaries 25 per cent. lower than those of other Universities, and our staff are working longer hours.

40,038. What are you able to pay your young assistants in your research laboratories, for instance?—Do you mean by way of scholarships or stipends?

40,039. By way of stipends?—I have paid some Rs.30 a month which they were thankful to receive because we could not pay them any more; they were students who had just passed the M.Sc. examination and wanted to carry on for some time. We started paying them Rs.75 per month, but our funds have not permitted us to continue to do so. We should like to pay them Rs.100 a month; if I could do that I could attract a number of Masters of Science to our research work.

40,040. For how long would young men of that class who have taken their degree of Master of Science continue to be satisfied with salaries of Rs.75 to Rs.100 a month if engaged on research?—They would carry on for three or four years, until they had taken their Doctorate, and then they would expect to be paid Rs.300 a month. We put them into the Rs.300 a month grade when they have taken their Doctorates; they are then paid from Rs.300 to Rs.500 by increments of Rs.25.

40,041. What is the salary of a full Science Professor of the University?—We pay the Principal of the College of Engineering Rs. 1,500 a month, while the Vice-Principal is paid Rs.1,000 a month rising from Rs.750, whereas in other Universities the salaries go beyond Rs.1,000 and Rs.1,200.

40,042. What is the pay of the men in the stage below that of full professor; I suppose you call them lecturers?—Yes; they receive from Rs.300 to Rs.500 a month; that is the next grade.

40,043. And I suppose nearly all of these men have taken the degree of Doctor?—Some of them, not all.

40,044. I am thinking of science men now?—We have two gentlemen who have taken their degree of Doctor in Germany; they are in that grade at present; and we have one gentleman who is from our own University; he has taken his degree in Calcutta; he is in the Rs.200 to Rs.300 grade. The others are Assistant Professors in the Rs.150 to Rs.300 grade. Those rates of pay are lower than those of any other University in India.

40,045. We were much interested in what we saw at Benares and we carried away in our minds one motto which we saw chalked up on a laboratory wall: "Research consists of 10 per cent. inspiration and 90 per cent. perspiration." I have been wondering in what degree that excellent

combination is remunerated by you at Benares?—The remuneration we could offer was so small that one of our best Professors had to leave Benares to come to Lahore; he was getting Rs.600 a month and Lahore University offered him Rs.1,200 to Rs.1,500; he asked my permission to go and I had not the heart to tell him not to go; I had to agree to it.

40,046. In view of the difficulty of getting funds to pay the men you have, would it not be desirable, when more funds become available, that the first expansion should be in the direction of assisting these post-graduate workers rather than setting up a full fledged College of Agriculture which would be an expensive undertaking?—It will be expensive but it will repay a thousand-fold; I consider that every pie spent on the promotion of agriculture is money very well invested.

40,047. I grant that, but I am thinking of your particular difficulty, namely, the difficulty of retaining your best students as research workers?—That is a question of how much funds we can get from the Government and the public. These research workers give their value in return to the country for any assistance they receive.

40,048. They do; my point is that they are likely to give a much greater return than you are likely to get from your agricultural graduates when you turn them out?—But there are two kinds of work that we have in mind: one is to help the farmers by experimental farming, the other is higher research work; we want to produce men of both types.

40,049. If you take up the first type of work to which you refer in order to help farmers, this will involve the setting up an agricultural college with, I suppose, a four years' course?—Yes, three to four years.

40,050. Your practical difficulty will be that you will get into that college young men of good education but with very little knowledge of agriculture, so that they will not only have to get their literary and scientific training from you but they will have to get from you their practical training. I ask myself this question: are you going to be able in four years to give them the scientific training that you aim at and also the practical training that will enable them to go out among the farmers and become real leaders among the farmers?—That is a question of selection; I feel that selection can be so made that students who have an aptitude for agriculture or have got farms might come in large numbers to the agricultural college.

40,051. Experience in other countries where the students are in closer touch with agriculture than they are on the average in India seems to indicate that to get men of that class you must have a longer period of training than three or four years?—That is why I say that the training should begin in the high schools. In the elementary schools we cannot give instruction in agriculture; but in the middle and high schools there should be a course in agriculture so that when they go up to the college they will have sufficient training in the subject.

40,052. The training which is so difficult to get is the training in practical methods; that cannot be given in a high school. For that you must depend in this country upon well founded farms?—There should be some schools in which such training should be given. In the central school attached to the Benares Hindu University, we have given little plots to the students to attend to, and they take really good interest in them. If I had a larger plot available, I would give them half an acre or an acre each and encourage them to cultivate.

40,053. I am not now questioning your policy or aims. What I am asking myself is whether, with the opportunities you have of developing this post-graduate work at Benares, it is wise to attempt at an early stage to found an Agricultural College?—Unless we have a College we shall not be

able to attract a sufficient number of young men to this work. I feel that the need for this work is growing and therefore we should have a College where we can attract a large number of young men and some will turn out to be good researchers.

40,054. You attract for your degrees in science men who take chemistry, botany, physiology and so on. Could you not select from among these students men who will make good and efficient workers in agriculture?—They are deficient in that very previous knowledge of agriculture which you have been referring to.

40,055. I was thinking of training them as laboratory workers, not as workers to go among the farmers?—Their interest should be enlisted at an early stage and that will be secured by admitting them to the agricultural college and allowing them to undergo a three or four years' course.

40,056. Sir James MacKenna has indicated the difficulty there is finding posts for these agricultural college men?—If at any time my wishes and prayers fructify and agriculture becomes a subject of living importance to the country, there will be plenty of work found for these agriculturists. There are more lawyers being created to-day than is necessary. I want to turn a large proportion of these young men on to agriculture and they will be much happier than many of these lawyers are at the bar to-day.

40,057. That we may agree to. But we have had a great deal of evidence to indicate that the Indian agriculturist, although, as you say he is looked down upon by his fellow men, knows a very great deal and he looks very carefully into the quality of advice that he gets from the college graduate?—You are thinking of the college graduate who is produced now in some of the colleges and our complaint is that the system is not satisfactory. We want to make it satisfactory to the people so that the college graduate will be as suitable to serve an agriculturist on his farm as, for instance, a college graduate of electrical engineering is fit to take up electrical engineering work. We want to give him that special training.

40,058. The difficulty is that the electrical engineer can get his technical training very rapidly. The work goes on in every day of the year and he learns quickly and gets experience quickly. The agriculturist, on the other hand, gets his experience only one or twice in a season and therefore his training, in order to make it valuable, must be much longer; it is a much more difficult matter to train your agriculturist; the difficulty exists all over the world, the difficulty, namely of converting urban classes who have no knowledge of agriculture into practical agriculturists?—That is true, but unless we endeavour to enlist a large number of young men into colleges of agriculture, agriculture will not make that progress which we desire.

40,059. The great demand at present is rather for the men whom you refer to as being of the lower or diploma standard?—Yes.

40,060. Who can go out as demonstrators and gain their experience actually in the fields?—Yes, but the other man is also needed. Unless the the graduate is also available, the system will not receive that fair trial which I wish.

40,061. There are many colleges at the present time which are giving the type of education which you are thinking of. Take Poona for example. Do you not think that the colleges in existence supply a sufficient number of places for the students who wish to get this kind of training?—The college existing in Poona will serve the area round Poona and a college existing in the Punjab will serve a small area round it. But the Provinces are very extensive. They are like the countries of Europe and you want at least one good agricultural college for each which will be popular and which will attract students in order that agriculture should receive a fair measure of attention.

40,062. In your case you have got a college in Cawnpore?—Unfortunately that college has not proved to be satisfactory. It has done good work as a farm, but for training men with a knowledge of agriculture and with an enthusiasm for agriculture, it has not been very successful.

40,063. Do you see a way of improving it?—Certainly. I want to put it on a basis in which the interests of the zamindars and the tenants will be enlisted; that is the great point which I have before my mind.

40,064. Has your University given any thought to the provision of literature suitable for villagers?—We are just at present in the tenth year of our life; the University began its work in October, 1917, and these ten years or less than ten years we had to lay down every brick on that site which you have been good enough to visit. We had to equip every Department. We have yet had no time to do extension work. We have it in our scheme, but we have not yet had the time for doing it.

40,065. I am not thinking of extension work. I was wondering whether any of the members of your staff are considering the preparation of such books for agriculturists?—We have asked them to prepare literature in the vernacular for teaching some of the subjects in the intermediate classes for the present, and they are busy with that work.

40,066. It has been frequently represented to us that one of the great difficulties in securing literacy in India is the fact that the village boy when he leaves the school has no suitable literature to read?—There is one book in this part of the country which supplies him all the literature and that is the Ramayan of Tulsidas. If a boy has learnt the three R's and if he gets a copy of the book which has been described as the Bible of 90 millions of the people, probably an under-estimate, he will be quite happy.

40,067. Does he read it?—He does; in the villages they do. If they could have that much of education, that they could read and write and cast up small sums and read the Ramayan, that would change them very much.

40,068. You have given us a depressing picture of the condition of the cultivator in many districts. I think you refer chiefly to the United Provinces and Bihar. Do you think that this condition is largely due to the fact that he has too small an area on which to live?—That is his misfortune, not his fault.

40,069. I ask you whether it is due to that fact?—Yes, partly; it is because of his suffering.

40,070. Do you know the average area of the holding in the United Province?—I know it is very small in some places.

40,071. Have you given any attention to the question of the size of the holdings?—I am very much in favour of the consolidation of holdings, and that depends upon the education that you give to the people.

40,072. *Professor Gangulee*: Would you have that by legislation?—No; by co-operation and voluntary methods.

40,073. *Sir Ganga Ram*: Is that possible?—At this stage I do not suggest legislation.

40,074. *Sir Thomas Middleton*: If consolidation could be effected it would be useful, but it would not affect the difficulty that arises from sub-division under inheritance?—That is true; that will have to be provided for and got over; but the first thing is to educate them about the advantages of it. At present the villager is taken aback entirely by a proposal like that. Propaganda work has to be done in order to make that idea acceptable to the people.

(The witness withdrew.)

Pandit Madan Mohan Malaviya.

RAO SAHIB RAO ABDUL HAMEED KHAN OF KAIRI, District Muzaffarnagar.

Replies to the Questionnaire.

QUESTION 1.—RESEARCH.—(a) (i) As in other branches of scientific knowledge, the spirit of research is always to be encouraged, as the guiding star of all agricultural activities. The department will be in the dignified position of meeting the demands of the advanced sections and the pioneers of agricultural movement. For the mass of cultivators, the department should always be in a position to give practicable suggestions. The research work should be conducted under the supervision of the transferred half of the Local Government. The Central Government should financially aid these activities and further give efficient technical help by appointing a Commissioner of Agriculture with expert staff to see that proper use is made of the help advanced; the new officer may be treated similar to the Educational Commissioner of the Central Government.

(ii) Veterinary research, so far as my observation goes does not very much differ in various Provinces and should be conducted by the Central Government. In this particular direction I emphasise the diet of animals, with a view to thorough scientific analysis of the various articles of fodder and nutrition.

QUESTION 2.—AGRICULTURAL EDUCATION.—I am particularly interested in the two years' course in agricultural education. Such institutions, for which the demand is daily growing, I regret are few and far between in this Province. The Bulandshahr and Cawnpore institution cannot supply the needs of the millions of cultivators in this Province. I suggest that every Division should be provided at least with one institution of this type and I have great faith in them. The teachers and students both should be drawn from the rural classes and I note with satisfaction that Bulandshahr school at least has successfully kept up the view. This will lead to uprooting the idea of Government service after such education, if any, and the education so imparted will be employed for the betterment of the vocation of the tenant class. Nothing stimulates such education as the experimental plot of land provided for the students. My only objection is that such plots are too small. Greater area should be provided for such work in future in such schools. The vernacular middle schools which at present satisfy neither those thirsty for knowledge nor the stomach of poor should be made more useful by providing in the curriculum, elementary agriculture as a vocation and as a feeder for two years' course schools. It is a pity that the literary education said to be imparted in these schools absorbs the lion's share of the budget without contributing anything towards agricultural improvement. I am strongly of opinion that the suggested introduction of agricultural education in middle and primary schools should be financed by the Education Department and supervised by the Agricultural Department. The middle and primary schools so far are a huge expensive luxury. A bare text book education of agriculture would not suffice. I therefore suggest that small farms and fruit growing plots should be provided. All this of course should be introduced gradually to suit the provincial budget. Last, but not least, I suggest that a course of seasonal lectures on agriculture should be organised in every Division or district to attract the youth of the middle classes, whenever they are free from agricultural activities. I submit that this will solve the agricultural problem a great deal in this country.

QUESTION 3.—DEMONSTRATION AND PROPAGANDA.—I believe demonstration farms and seed distribution are the two tangible steps that have led to the popularity of scientific agriculture in some measure.

I think the utility of Government farms is seriously curtailed by the new Councils trying to commercialise them. So far as I know, the idea of progressive experiment is suffering from the strictures placed on the farms and the desire to turn them into a profitable enterprise. I fully approve and appreciate the idea of locating small farms in the centre of a group of villages so as to be easily accessible to all. The purpose would be best served by supervising the private farms and helping or encouraging them on a selective basis, not unlike the idea of granting Government aid and affiliation to private educational institutions on their good work with similar restrictions. What I gather from a purely Government farm is that to a village it is a superstructure and perhaps a costly museum. The idea of infusing reform cannot be developed except by a private farm.

I hope the Commission is fully cognisant of the conservative character of the masses and the persistent nature of this conservatism. It is a parasite which is considered a panacea. The situation is a tragic one, the nature of educative work is arduous, even Herculean. I therefore suggest that the office and the duties of the Directors and the Deputy Directors of Agriculture should be considered from an educative point of view. They should be touring officers going about in the country and mixing with the masses, as the high Canal Department Officers do in their seasonal tours. I insist on the Director and Deputy Directors doing so, because I am fully convinced that the subordinate and junior officers neither command the confidence nor the respect of the masses. The great success of the Government horse-breeding campaign depended mainly on this one point. The idea is useful also for more purposes than one. The exploitation of the masses for political purposes, which is not a little helped by the isolation of the senior officers, will be greatly minimised and the officers also learn more to sympathise with the masses and will daily equip themselves better by practical experience in serving them.

QUESTION 4.—ADMINISTRATION.—Considering the percentage of agriculturist population, I cannot understand the paucity of staff in the Agriculture Department. Does the Government sincerely think that one Inspector of Agriculture suffices for the agricultural needs of a whole district? More staff thus is the first necessity. I think no department is more ill-supplied with employees. The slight awakening which the sprinkle of elementary education has created has led the young agriculturist to consider the awful disparity between the Government income from rural areas and the expenditure on their improvement. He is not a little grieved to find his wealth being robbed to beautify the towns and the cities. Before this latent evil takes horrible proportions and develops into a relentless class war, the Government should realise the possibilities of such an attitude.

The means of communication and transport and the people responsible for them are being subordinated to the needs of the urban gentry and the executive. They may connect big and small towns, but the agricultural point of view is completely lost sight of.

QUESTION 5.—FINANCE.—The Agricultural and the Co-operative Departments co-ordinated can go a great way to solve the difficulty. The rate of *taccavi* interest should be lowered and the Agricultural Department should popularise the *taccavi* loans.

QUESTION 6.—AGRICULTURAL INDEBTEDNESS.—Indebtedness is a normal condition of the agriculturist. The tenant has a family deity and a family moneylender. He is reconciled to the tyranny because he thinks the Government has neither the inclination nor the will to rescue him. The moneylending class is a hierarchy with age-long traditions of parasitism and the callous instincts of a blood-sucker. The family contracts a debt which simply cannot be paid off. The hydra-headed monster of exorbitant rates, compound interest, clever manipulations, double payment notes with multiple

rates of interest, are all the clever threads of a spider web which a tiny fly simply cannot escape. The majority of small cultivators are but the labourers of a moneyholder, the whole harvest is generally given on to him to reduce debts at a ridiculous rate. They labour for him, perhaps drag on a weary life in the impossible attempt to pay off an old debt. If the labours of the Commission were to result in relieving them in this one direction, I think they would rightly consider themselves amply compensated.

I think, apart from some old marriage customs, the main causes are the recurring deaths of animals, the money compensation for a bride, the exorbitant cost of litigation and the process of justice and the extortions of police and petty officers.

I press that a law similar to the Borrowers' Protection Bill of Punjab should be immediately enacted, the Usurious Loans Act enforced with all possible vigour, and compounding of the cases outside the court by means of the *panchayat* or otherwise should be encouraged. If for the professional moneylender the Government substitutes the system of *taccavi* or agricultural co-operative banks, they can understand and appreciate it as a measure of Swaraj.

So far the Government has wrongly diagnosed the disease of the tenant by considering the landowner responsible for his misfortune, and the remedies thus suggested have proved ineffective. The real disease is that the moneylender has cleverly evaded his well merited punishment. I fear that the people have often consoled themselves by considering the masses as dumb driven automatons. My experience as one of them is that the tenants are fully conscious and groaning under the weight of the moneylender. They are indignant and feel outraged against this class and against the Government in leniently treating them. They have sometimes not a little sighed for a Swaraj when, without the Government, they would be at liberty to give the moneylender a return blow.

To safeguard the interests of the agriculturist by law, the Government should take at least those measures which the Punjab Government has taken, by passing the Land Alienation Act.

QUESTION 8.—IRRIGATION.—The canal system may be and is capable of expansion, but does not and cannot satisfy the needs of all parts of this country. We should adopt the modern methods of drawing water out of land, *e.g.*, by tube wells. What the United Provinces Agricultural Department has done in the direction cannot be overestimated. But we have to cheapen the modern machinery of drawing water and devise a very cheap and practical instrument. It is a new subject for research, and much depends on finding a suitable remedy for it.

QUESTION 10.—FERTILISERS.—I fear nobody in my Province is competent to deal with the question at first hand, because no experiment in any appreciable degree has been made in this direction. But I recognise the necessity of providing the necessary apparatus to examine the soil and suggest the manures in district farms within the reach of cultivators. Fraudulent adulteration of fertilisers may be checked by an enactment. I think the methods for improved seed should be adopted to popularise the fertilisers also.

QUESTION 11.—CROPS.—The wheat produced in my Province is not so good in quantity as it can be. We should advertise the results of the Lyallpur experiments or take some other step to consider our possibilities in this direction. Similar is the case with cotton. We should devote greater attention towards oilseeds because they are more paying.

QUESTION 14.—IMPLEMENTS.—The popularity of machinery can be pushed further, if the department can spare men or employ others to go round the countryside and demonstrate the use of modern implements and sell them

on credit. The advertisement of Singer and other sewing machines is an example in point.

QUESTION 15.—VETERINARY.—The ridiculously few men employed for the Veterinary Department are responsible for the frequent diseases amongst the animals. Millions of animals die annually, and those that live are no better. Efficient expert advice available to every peasant is the only remedy. Veterinary dispensaries should be increased in number and the administration should be taken over from the Local Boards. I know of hundreds of deaths of animals that were never brought to the notice of the department, thanks to the rule which leaves such reports to be made by the *patwaris* owing to the paucity of employees.

(*d*) Yes, I do agree to such legislation.

QUESTION 16.—ANIMAL HUSBANDRY.—In regard to cattle breeding, I think the United Provinces Government has paid no attention to goat and sheep breeding. The general census also shows a decrease in the direction, although this one improvement will go a great way in solving the great problem of cow sacrifice, would provide excellent food stuff and a means of living to many. It is also useful in other directions. A special sum should be allotted in the Provincial Budget for it. I very much appreciate the idea of patronising and encouraging milk supplying agencies introduced by the Government of this Province and expect very good results from it. In my locality fodder is not an acute question.

QUESTION 23.—GENERAL EDUCATION.—The Government should make a particular note that the revenue and police employees that come in contact with the masses of agriculturists should be intellectually well equipped to understand and sympathise with their needs and be able to give practical suggestions for the betterment of their general life. The training schools at Moradabad should provide a course of instruction wherewith the students should be able to understand the agriculturist point of view and their needs. A regular subject on these lines should be included in all competitive examinations where possible. Boys coming out of Cawnpore and Bulandshahr should have openings in Government service and not be debarred on account of their agricultural qualifications. With regard to the general education and culture of the agriculturists, the District Boards should organize night schools in the villages for adults. The department should organize magic lantern lectures, which will go a great deal in attracting agriculturists and liberalise and widen their outlook. Without religious and vocational studies, compulsory education, I think, is wholly unacceptable to the masses and will not result in any good to the rural areas.

The primary reason for the small percentage of boys is the purely literary character of the education. There are a few offices in a village which require a little education: those of the Headman, *pandit*, *maulvi* and *patwari*. Letter writing or reading over the counterfoils is enough for them. The villagers do not find any use for the present education. It, moreover, spoils a youth and makes him less hard working and expensive.

QUESTION 24.—ATTRACTING CAPITAL.—(*a*) I am afraid I will be exceeding the limits of the terms of reference of the Commission in doing justice to this very important problem. The only class that can spend wealth successfully on this enterprise and really utilise it is the landowning class. Individual farmers may improve the situation, but not appreciably. At any rate their efforts would not result in turning it into a national wealth on any big scale.

The Government therefore should, in the first place, make a clear distinction between the landholders who reside in the city and those that habitually live in their villages and encourage the latter. They should be encouraged in starting the farms, and all facilities should be provided in

acquiring land for their own cultivation which has been cruelly almost denied to them by the present Tenancy Act. This would not deprive the majority of tenants of their holdings, but even if it does in some cases it will be a distinct improvement on the present position, as such tenants will serve as labourers on the fields of their zamindars. Even if the conscience of the radical reformer be not satisfied, the material position of the tenant would be far more improved under the new arrangement. To take an instance in point, the labourer at the tea garden or in a large scale enterprise as the Tatas is in a better position than one on a small holding. Under the present unfortunate circumstances, the position of the tenant in relation to the moneylender is no better than that of a labourer, as I have previously pointed out. The new change at its worst would not worsen his lot. I think the relation of a landholder towards the tenant is by tradition one of guide, philosopher and friend. The profits in that case will depend on the more efficient labour of the tenant, which naturally means greater comfort and better health for the tenant himself. This will lead to greater interdependence of both the classes and keep both engaged; otherwise it can only lead to greater discontent among the tenant and a spirit of sloth amongst the landowners, which is a demoralising influence from the point of view of the country.

(*b*) 1. The main cause in some cases that deters improvement is the basis of cash rent. The zamindar, as long as he gets the cash payment, has no worry about improvement. As long as that continues, the relation cannot advance beyond sordid commercialism. This form of renting should in future be considered criminal and stopped at once; on the other hand there should be substituted the system of rent on the basis of grain which alone can unite them and make both solicitors of mutual interest. The system is prevalent in some parts of the Punjab, and its result shows a remarkable improvement in agricultural conditions. The rent, if paid in kind according to the harvest, will enlist the interest of the zamindar to see that the land and its produce improve.

2. The attitude of the Government in every country means much; in this country it means everything. We have an almost slavish mentality and independent initiative to us is still foreign. The encouragement and discouragement of the Government means to us a great deal. If the distinctions, titles, *sanads* were to be given on the basis of improving the condition of agriculture, the animals and the tenants, a decade would see the country side flowing with milk and honey. The Government, for the upkeep of law and order, awards and encourages all those who help it in maintaining it. Were it equally to value the agricultural improvement and award distinction for it, it would be setting a tone to the country. This would further give dignity to the distinction and associate the landlords with real social work. This was the attitude adopted towards the pioneers of the Western education movement.

I therefore suggest that it should be the considered policy of the Government to award a great number of distinctions on the consideration of improvement in the condition of agriculture.

3. The Central Government should organize an all-India agricultural association on the lines of the National Horse Breeding Society under the patronage of His Excellency the Viceroy, the Commander-in-Chief, the Ruling Chiefs and the prominent men of the country, with the Agricultural Commissioner of the Government of India as its Secretary. This association should organise an annual agricultural exhibition for the best produce at Delhi and infuse a healthy sense of competition among Provinces.

The Provinces also should organize branch associations in every district on similar lines. This association should publish a magazine in Hindustani on the lines of the National Horse Breeding Magazine.

This reply also covers the reply to Question 25 (*a*).

Oral Evidence.

40,075. *Sir Henry Lawrence*: Rao Sahib Rao Abdul Hameed Khan, we did not receive your note till this afternoon, and we are not fully acquainted with it. What is the main point to which you wish to draw our attention?—I should like to mention that in my Province, the Director and Deputy Directors of Agriculture do not go out on tour in rural areas so frequently as I think they should. I think they should be essentially touring officers and go about in rural areas in the same way as the Chief Engineer does in canal areas, so that the people may have first-hand information and come in contact with the superior officers of the department.

40,076. That is a very good point. Has the Director ever visited Muzaffarnagar?—Not to my knowledge; if he comes he only visits the district farm; he does not go out to rural areas.

40,077. Have you got lands in Muzaffarnagar District?—Yes.

40,078. You cultivate your own land?—Yes, I am starting a very big farm; my tube well is under construction, and it will be ready, I think, by the end of this month.

40,079. Have you had any assistance or advice from an officer of the Agricultural Department?—All that I needed.

40,080. You have received advice and assistance?—Yes.

40,081. From whom?—From the Director and from the Agricultural Engineer. I have been given a grant of Rs.5,000 on a seed contract, and all the advice I required.

40,082. On page 739 you speak of the tyranny of moneylenders and the improper leniency of Government towards moneylenders, and you say that whereas it is supposed that the zamindars are the cause of the troubles of the ryot, in fact it is not the zamindar but the moneylender?—Yes.

40,083. What remedy do you propose?—I think legislation might be passed on the lines of the Borrowers' Protection Bill in the Punjab.

Mr. Calvert: That Bill passed the Punjab Council, but was disallowed by the Governor; it began as a Moneylenders' Registration Bill, then it was called the Borrowers' Protection Bill, and it was finally passed as the Moneylenders' Accounts Bill, I think.

40,084. *Sir Henry Lawrence*: It is for the registration of the moneylenders, is it?—Yes, and to control them so that they may be required to keep accounts.

40,085. *Mr. Calvert*: To keep accounts in properly paged books and to give copies to the borrower?—Yes, just as we zamindars are required to give receipts to our tenants.

40,086. *Sir Henry Lawrence*: Have you studied that Bill?—No, I have not; I have heard of it and read in the papers about it.

40,087. And you think a Bill of that character would be of use in your Province?—Yes, just as Government has tried to save tenants from the tyranny of the zemindars, for which I think there was no need; such attention might be devoted to moneylenders.

40,088. Then I see that on page 740 you say you wish to see some encouragement given to landholders to reside on their lands?—Yes, I want the Government to encourage those zemindars who reside usually in their villages.

40,089. Is there a tendency now for landlords to leave their villages and go and live in the big cities?—It is a growing tendency on account of the latest Tenancy Act which is in force in our Province.

40,090. When was that Act passed?—Last year.

40,091. And you do not approve of that Act?—Not at all, because it has left no opportunity for the zamindar to take an interest in the improvement of the land; he cannot take land for his own cultivation without paying in one case three times and in another case six times the rent paid by the tenant.

40,092. You wish to abolish the system of cash rents and to substitute *batai*?—Yes, so that the landlord may take more interest in the land.

40,093. Is cash rent compulsory on the zamindar?—Yes, it is almost compulsory under this new Act.

40,094. You think the old system of *batai* was better?—Yes.

40,095. Is the *batai* system rendered illegal under the new Act?—Yes, it is rendered illegal. So far as cattle breeding in my Province is concerned, no attention is paid to the improvement of goat and sheep breeding; that, I think, would solve the problem of cow slaughter or sacrifice to a considerable extent.

40,096. Are any zamindars taking any measures to improve their own sheep by introducing better rams?—No, not at all.

40,097. No zamindars are doing that?—Not to my knowledge.

40,098. Is any zamindar taking an interest in the improvement of the breed of goats?—Not to the extent required.

40,099. You want a lead in that direction from the Agricultural Department?—Yes.

40,100. *Professor Gangulee*: Are your moneylenders mostly Mahommedans?—They are both Mahommedans and Hindus.

40,101. *Sir Thomas Middleton*: You complain of the policy that has recently been adopted of commercialising the Government farms?—Yes. We have farms in the district, and my idea is that they should be essentially experimental farms; they should not be required to be paying concerns.

40,102. Was not that change in policy the result of the views of the Legislative Council of the United Provinces?—That change was affected when the Liberals, as we call them, were in the majority on the Council.

40,103. Was the number of demonstration farms reduced at that time? Had you any farms in your district which were closed because of that policy?—No, not at all; why should they be closed? But now the people in charge of the district farm cannot pay sufficient attention to experiments.

40,104. Then you think the Agricultural Department has much too small a staff?—Yes, I think so; in some cases there is no man of the department in a district; in some cases there are only two or three men in one district, of whom two supervise the district farm at headquarters and one who is called an Inspector is a touring officer in the rural areas. In a district one can imagine how much one Inspector can do.

40,105. Have you tried and failed to get some representative of the department to visit you?—There are very few people who care to ask a representative of the department to visit them.

40,106. Why is that?—Because they do not fully appreciate what the Agricultural Department is doing for them; that is owing to their ignorance.

40,107. What size of tube well are you putting in?—It will give me 35,000 gallons of water per hour.

40,108. How much are you going to irrigate?—It will command an area of 1,000 *bighas*; 500 *bighas* every season.

40,109. Are you proposing to grow sugarcane and wheat?—Mainly sugarcane; wheat is not a success in that part of the country.

40,110. What will you grow in that part of your land that is not under sugarcane?—Wheat, but my first concern will be to grow sugarcane.

40,111. *Sir Henry Lawrence*: Have you anything further to say?—I want to draw the special attention of the Commission to my reply to Question 4. I want the Government of India to organise a central association such as they have organised in regard to horse-breeding, which has, I think, done a lot of good.

That will be noted.

(The witness withdrew.)

The Commission then adjourned till 2.30 p.m. on Saturday, the 26th February, 1927, at Hissar.

APPENDIX I.

(Q. 35,159).

Letted No. 3210-I.W./92B-1114W of 1927, dated the 26th March, 1927, from Mr. B. D'O. Darley, C.I.E., I.S.E., Chief Engineer, United Provinces, Public Works Department, Irrigation Branch, Lucknow.

Sir Ganga Ram drew special attention to the formula for calculating the protective value of an acre printed on page 32 of volume I of the Indian Irrigation Commission's Report of 1901-03. He suggested that if this formula were applied to districts other than those needing famine protection works in these Provinces it is probable that we would find that expenditure on canal works although not productive would be permissible. I have now had a statement prepared for all the districts in these Provinces which are not covered by our existing or projected canals. This list which is attached will show how impossible it is to apply this formula to a district where famine expenditure is low, that is, where protection is not needed. To explain in detail why this difficulty arises I attach a note on the subject which makes the matter very clear.

Method of calculating the protective value of an irrigated acre and the permissible capital outlay per acre.

The Royal Commission on Indian Irrigation considered that the best means of ascertaining the necessity for the introduction of canal irrigation was that of calculating the direct protective value of the irrigated area. In their view it could be estimated for any particular tract by considering in the light of past experience,

(i) probable cost of famine relief in the future where no irrigation project constructed,

(ii) the population.

(iii) the area usually cropped.

(iv) the area which may be regarded as already protected.

(v) minimum area which should be protected to tide over a period of severe drought.

Then if:—

x = the direct protective value of an irrigated acre, or the capitalised value, at 25 years' purchase, of the saving in the average annual cost of famine which will be effected by every acre brought under irrigation.

F = estimated total cost of famine in a given tract for a period of 25 years, or a quarter of a century.

P = population of the tract with necessary addition for prospective increase.

n = area in acres which should be protected by irrigation for each head of the population.

a = Area in acres already protected.

$$x = \frac{F}{Pn - a}$$

Note on the co-efficient n.—This varies in each tract, but for insecure tracts it will probably never be less than 0·3 or more than 0·5, other things being equal the value of n should diminish as the area normally cropped per head of population increases; but:—

(i) the character of the cultivation,

(ii) nature of staple crops,

(iii) other points affecting the question require consideration also when possible,

(iv) the conditions in villages which are adequately protected within the same tract, should be considered.

The co-efficient n therefore is extremely difficult to determine. The whole formula depends on a definite assumption that if we protect a certain definite fraction of an acre for every head of population that all expenditure on famine or scarcity will automatically vanish. This is a very broad assumption to make.

Reverting to the formula F is the famine expenditure during 25 years. (Pn-a) is the additional area which we must protect in order that F may vanish, x therefore is the amount of famine expenditure in 25 years that will vanish for every additional acre irrigated, or the capitalised value at 25 years' purchase of the saving in the average annual cost of famine.

Every acre proposed to be irrigated will therefore bring in an average income direct of $\frac{x}{25}$

The value of x in the opinion of the Commission should not exceed Rs.60 in a district that has suffered very severely from famine.

This formula, as its name suggests, was primarily designed to estimate the utility and the necessity for executing famine protective works in districts which suffer severely from famine. It is a rough empirical formula adequate to the purpose for which it was designed, but it is clear that it must be used with caution. The denominator of this formula is a *difference* and this should make one very chary of applying it in a mechanical manner.

For example let us suppose that Pn is very slightly greater than a. Then the value of x will become collossal and will become infinite when Pn is equal to a. If a is very slightly greater than Pn, x becomes infinite and *negative*. Both these results are absurd and are due to a misuse of the formula. It is clear that the nearer Pn approaches a, the less applicable this formula becomes, and in view of the entirely arbitrary manner in which n is assessed we can, when the difference between Pn and a is not great, make x practically anything we like according to the precise value which we arbitrarily assign to n.

Famine and scarcity expenditure can *not*, as a fact, be entirely eliminated by protecting a certain definite fraction of an acre per head of population. If the formula were really absolutely correct instead of approximately correct, which is all we can demand of any formula, then if (Pn-a) were one acre, as it well might be if the formula were unintelligently applied to a district with a comparatively small famine expenditure, then the irrigation of that *one acre* would wipe out all famine expenditure in the future. Such a conclusion is absurd. It shows that n is an approximate co-efficient embodying a purely empirical and approximate assumption. When all famine expenditure has been met, then if we deduct from this the expenditure that could be obviated by complete protection of the area concerned there would *still* be a small residium of famine expenditure "f" that is accounted for by the economic depression which a failure of the

monsoon induces even in a fully protected district. A statement showing values of x for different districts in the United Provinces has been worked out and accompanies this note; as is to be expected, some of the results are anomalous. This is inevitable when the districts are so near the border line and the famine expenditure so small. Reverting now to the definition of n, n is the protected acreage per head necessary to render a district free from famine expenditure.

When there is no famine expenditure and famine expenditure is just avoided and no more.

$$Pn - a = 0 \quad \ldots\ldots (1)$$

$$F = 0 \quad \ldots\ldots (2)$$

$$x = \frac{0}{0} \text{ which is indeterminate.}$$

From equation (1) $n = \frac{a}{p}$.

What we have now to do is to select districts in which F is nil or very nearly so. A lakh of rupees appears to be negligible expenditure on famine relief in 25 years. The following table gives values of F, P and a for five districts in which the famine expenditure per head of population is negligible.

District.	F.	P.	a.	n.
Gorakhpur	37,306	3,593,513	949,000	·263
Ballia	39,705	914,110	269,000	·294
Ghazipur	60,903	915,518	272,000	·297
Partabgarh	79,829	940,643	356,000	·378
Moradabad	110,764	1,318,518	228,000	·173
Total	328,507	7,682,302	2,074,000	·270

Common sense tells us at once that the value of x in such districts must be absolutely negligible. Nevertheless the table would show that if we assume n to be 0·3 the value of x in the Ghazipur district is no less than Rs.22·9. This absurd result is due to our assuming a wrong value of n, and also to our applying the formula when it is really inapplicable. It is due also to our neglecting the residuum "f." These districts all have a small famine expenditure which is probably largely independent of any value that we choose to assign to "n."

In the case of Ghazipur, the impropriety of applying the formula is at once apparent. To begin with it is clearly impossible to assign a value of n with meticulous accuracy.

Example 1.

Let us apply the formula and let $n = 0{\cdot}3$. Then in the case of Ghazipur

$$x = \frac{60,903}{274,665{\cdot}4 - 272,000} = \text{Rs. } 22.94.$$

Example 2.

Taking the same district let $n = 0{\cdot}325$

$$x = \frac{60,903}{297,543{\cdot}4 - 272,000} = \text{Rs. } 2.38.$$

Example 3.

Taking the same district, let $n = 0{\cdot}2975$

$$x = \frac{60{,}903}{272{,}366{\cdot}6 - 272{,}000} = \text{Rs. } 166.13.$$

All these results are of equal value because all are valueless. They are all valueless because the formula is a difference denominator formula and a most dangerous type to use in a mechanical manner. Referring to example 1, a glance at the denominator shows that had the protected area been increased by a paltry 2,655 acres, the famine expenditure of Rs.60,903 would not have been incurred. This is clearly absurd; or alternatively had the population been reduced from 914,110 to 913,333, that is to say, had 777 persons absented themselves from the district there would have been no famine expenditure at all.

There is no need to further labour the point. The formula is very useful when the famine expenditure is of serious moment and the difference between Pn and a is large enough to warrant its use.

As to Ghazipur it is clear that there is a certain famine expenditure "f" which is not a function of "n" at all. The Gorakhpur district, it will be seen, is the largest of all the districts, and the famine expenditure so small that it should be excluded from our table altogether. It is an interesting district as it shows that "n" may fall below the value of 0·3 assigned by the Commission and yet the district be free from famine expenditure, or at least as free as any district can expect to be. For the four remaining districts assuming that the small famine expenditure is not a function of "n" but dependent on other considerations, we have:—

District.	f.	f/p. Rs. per million of population.	P.
Ballia...	39,705	43,436	914,110
Ghazipur	60,903	66,523	915,518
Partabgarh	79,829	84,866	940,643
Moradabad	110,764	84,006	1,318,518
Total	291,201	71,209	4,088,789

This table clearly shows that districts which can fairly be regarded as immune from famine in the true sense of the word have a famine expenditure varying from roughly Rs.45,000 to Rs.85,000 per million of the population in 25 years. The average is roughly Rs.70,000.

$$\text{F therefore} = Pk.$$

In which k is a constant with an average value of 0·07. It would appear quite reasonable to neglect all famine expenditure of less than one lakh per million of population in 25 years.

This means that the famine formula for x must not be applied when the famine expenditure in 25 years per head of population is one lakh or less. If the expenditure is greater we must deduct f from F before applying the formula and

$$x = \frac{\text{F} - 0.1\ \text{P.}}{Pn - a}$$

Applying the old formula to the Budaon district and assuming a value of n of 0·3

$$x = \frac{653,865}{321,864 \cdot 6 - 306,000} = \text{Rs. } 41.22.$$

had the population been 1,050,000 instead of 1,072,882, x would have been

$$\frac{653,865}{315,000 - 306,000} = \text{Rs. } 72.65.$$

Applying the new formula

$$x = \frac{653,865 - 107,288}{15,864 \cdot 6} = \frac{546 \cdot 577}{15,864} = \text{Rs. } 34.45.$$

Applying the new formula and assuming the population reduced to 1,050,000

$$x = \frac{653,865 - 105,000}{315,000 - 306,000} = \frac{548,865}{9,000} = \text{Rs. } 60.99.$$

The two latter calculations for x are much more likely to be correct than the results given by the old formula.

Statement showing the protective value of an area of irrigation in the various districts.

$$\text{Formula } X = \frac{F}{pn - a}, \quad n = \cdot 3.$$

District.	Famine expenditure plus remissions of revenue for past 25 years.	Population in 1921 plus 10%.	Area already protected = Irrigable area.	Protective value, $X = \frac{F}{pn - a}$
	F	P	a	
Bijnor	1,90,767	814,200	87,000	1.2
Badaun	6,53,865	1,072,882	306,000	41.2*
Moradabad	1,10,764	1,318,518	228,000	0.7
Benares	1,74,690	991,443	210,000	2.0
Jaunpur	7,37,850	1,270,616	481,000	Negative
Ghazipur	60,903	915,518	272,000	22.9*
Ballia	39,705	914,110	269,000	7.6*
Gorakhpur	37,306	3,593,513	949,000	0.3
Basti	6,14,184	2,117,751	772,000	Negative
Azamgarh	2,01,560	1,681,523	605,000	Negative
Fyzabad	7,48,089	1,289,123	410,000	Negative
Gonda	23,06,121	1,620,408	392,000	24.5
Bahraich	35,30,655	1,171,915	102,000	14.1
Sultanpur	6,55,650	1,104,303	377,000	Negative
Partabgarh	79,829	940,643	356,000	Negative
Total	101,41,938	20,816,466	—	—

In the case of figures marked *, the high protective value is due to the area already protected being only a little less than the area which should be protected.

APPENDIX II.

AGRICULTURAL NOTE.

By the Honourable Lala Sukhbir Singh.

(See page 654, Question 39,504.)

The Royal Agricultural Commission has commenced its work and is now taking evidence of witnesses, the majority of whom are up to this time experts and officials. May I bring to the notice of the commission that in the year 1889, Dr. Voelcker was appointed by the British Parliament to visit this country and report on the condition of agriculture. On page 11, Chapter ii of his report he has stated that "at his best the Indian Raiyat or cultivator is quite as good as, and, in some respects, the superior of, the average British farmer, whilst at his worst it can only be said that this state is brought about largely by an absence of facilities for improvement which is probably unequalled in any other country, and that the Raiyat will struggle on patiently and uncomplainingly in the face of difficulties in a way that no one else would.

"Nor need our British farmers be surprised at what I say, for it must be remembered that the natives of India were cultivators of wheat centuries before we in England were. It is not likely, therefore, that their practice should be capable of much improvement. What does, however, prevent them from growing larger crops is the limited facilities to which they have access, such as the supply of water and manure. But, to take the ordinary acts of husbandry, nowhere would one find better instances of keeping land scrupulously clean from weeds, of ingenuity in device of water-raising appliances, of knowledge of soils and their capabilities, as well as of the exact time to sow and to reap, as one would in Indian agriculture, and this not at its best alone, but at its ordinary level. It is wonderful, too, how much is known of rotation, the system of 'mixed crops,' and of fallowing.

"Certain it is that I, at least, have never seen a more perfect picture of careful cultivation, combined with hard labour, perseverance, and fertility of resource than I have seen at many of the halting places in my tour."

After this, Government of India opened Agricultural Departments in every Province and had a central control over them till the reforms were introduced, but it will appear how little has been done when we see, as stated by Dr. Clouston, Agricultural Adviser to the Government of India, before the Royal Agricultural Commission on 13th October last at Simla, that "if Provincial Budgets were included the Central Government were spending Rs.83 lakhs all over India for Agriculture," which, if calculated on an approximated amount of 50 crores of land revenue proper, excluding so many other incomes from lands, comes to about Rs.1/10/3 per cent., that is three pies per rupee.

Similar has been the case of agricultural industries. A Royal Commission was appointed under the presidentship of Sir T. H. Holland in the year 1916 to make enquiries and report how Indian industries could be improved, but although the report was so full and had several minutes of dissent by such eminent persons as Pandit Madan Moham Malviya, may I ask what the Government has done?

Now let us see what recommendations this commission will make and what action the Government of India will take on it.

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GLOSSARY.

ABADI ... ... Settled, cultivated.
AHIR ... ... A pastoral caste of Hindus.
AMIN ... ... A subordinate revenue official of Government.
ANNA ... ... One-sixteenth of a rupee; equivalent to 1½d. at exchange rate of one and sixpence to the rupee.
ARHAR ... ... Pigeon pea (*cajanus indicus*).
ARHAT ... ... Agency, brokerage, commission.
ARHATIA ... ... An agent or broker.
ASHWANI (ASHWIN)... A month of the year, from mid-September till mid-October.

BABUL ... ... A common tree (*acacia arabica*).
BADMASH ... ... A disreputable person.
BAGASSE ... ... Residue of sugarcane after the juice is expressed.
BAGDI ... ... A low caste of Hindus.
BAJRA ... ... A small millet (*pennisetum typhoideum*).
BANIA ... ... A Hindu trader or money lender.
BANJARA ... ... An itinerant tribe of grain and cattle merchants.
BARANI ... ... Unirrigated land depending on rain for its water supply.
BATAI ... ... Payment of rent in kind, by division of produce between landlord and tenant.
BEL ... ... A small sugar factory.
BI'PARI... ... ... A shopkeeper or travelling trader.
BERSEEM ... ... Egyptian clover (*trifolium alexandrinum*).
BHABAR ... ... The forest under the Sewalik hills.
BHADIA ... ... A month (August-September).
BHAIYACHARA ... A class of land tenure in the United Provinces.
BHUSA ... ... The husk or chaff of grain; the straw.
BHUSHI ... ... See *Bhusa*
BIGHA ... ... A measure of land; the standard or *pucca bigha* is 3,025 square yards or 5/8ths of an acre; a *kutcha bigha* is in some places 1/3rd in others 1/4th of a standard *bigha*.
BINAULA ... ... Cotton seed.
BINDI ... ... Vegetables (lady's fingers).
BOURI ... ... A low caste of Hindus.
BRAHMACHARI ... A student of religion; one leading a life of celibacy and devoting himself to religious study.
BUND ... ... A dam.
BUNJAR ... ... Barren.

CHABENA ... ... Parched grain; an allowance to grain weighmen.
CHADAR ... ... A sheet or cloth.
CHAIT ... ... A season (March-April). *Chait badi panchami*—the fifth day of *Chait*.
CHAK ... ... A block of portion of land.
CHAKBAT ... ... Pertaining to blocks (*chaks*).
CHAMAR ... ... A worker in skins. One of the depressed Hindu castes.
CHANA ... ... Gram, chick pea (*cicer arietinum*).
CHAPRASI ... ... A peon, messenger.
CHARAS ... ... A water lift.
CHAUKI ... ... A post where a watch or guard is stationed.
CHAUKIDAR ... ... A watchman.
CHHATAK ... ... One-sixteenth part of a *seer*.
CHOTA ADMI ... ... Lit. a small man.

CHUNGAWALLAH ... A person (*wallah*) who receives a contribution (*chungi*) in grain for the use of market conveniences.
CIKRA ... ... Denoting one hundred.
COLABA... ... ... Water channel; also denotes outlet from a main to a branch channel.
CRORE ... ... Ten millions.

DAL ... ... A generic term applied to various pulses.
DEODAR ... ... The Himalayan cedar (*cedrus libani*).
DESI (DESHI)... ... Native to the country; indigenous.
DHAK ... ... A moderate sized deciduous tree (*palas*) with a brilliant red flower (*butea frondosa*).
DOAB ... ... A tract of land lying between two confluent rivers.
DUBLA ... ... A low caste of Hindus.

EKKA ... ... A one-horse vehicle.

FALGUN (PHAGUN) ... The name of a month; mid-February to mid-March.
FASL ... ... Crop or harvest.

GAUNI ... ... A measure of rice.
GHAR ... ... A strip of land lying along, or near the banks of a river.
GHAUT (GHAT) ... A mountain; a landing place on the bank of a river.
GHI ... ... Clarified butter.
GHOSI ... ... A herdsman or milkman.
GOWALA (GWALA) ... See *Ghosi*.
GOWSHALA ... ... A refuge home for cattle.
GRAM ... ... See *Chana*.
GUAVA ... ... A small evergreen tree (*psidium guyava*), grown solely for its fruit.
GUL ... ... A water channel.
GUNT ... ... A measure of land, equal to 121 square yards.
GUR ... ... Unrefined Indian sugar, jaggery.

HAISIAT (HAISYAT) ... A statement of assets and liabilities.
HAKIM... ... ... A practitioner of one of the Indian systems of medicine.

JALPAN... ... ... Drinking water; any light refreshment.
JAMABANDI ... ... An annual account of lands held in a village and the amount of land revenue due on them.
JAT ... ... A race of people inhabiting Northern India.
JHIL ... ... A shallow lake, a swamp.
JHUMING ... ... Temporary cultivation in jungle clearings.
JINSWAR ... ... Classification of land according to crops.
JOTDAR ... ... A cultivator.
JUAR (JOWAR)... ... The large millet (*sorghum vulgare*).

KADBI (KARBI) ... Straw of juar (millet).
KALAR (KALLAR) ... Saline efflorescence.
KALAR (KAHAR) ... A low caste of Hindus.
KAHAR ... ... A water carrier.
KAMIA... ... ... An agricultural labourer.
KANDA ... ... A piece or portion; applied to dried cow-dung cakes.
KANKAR ... ... Nodules of limestone found in the soil.
KANUNGO ... ... A subordinate revenue officer.
KANS ... ... A coarse deep-rooted grass weed (*saccharum spontaneum*).
KAPAS ... ... Cotton with seed still adhering, unginned cotton.

KARDA ... ... Exchange, barter.
KASHTKAR ... ... Cultivator.
KATHA ... ... A grain measure of 5 *seers*.
KHADAR ... ... Moist alluvial land easily irrigated or which can grow crops without irrigation.
KHADDAR ... ... A kind of coarse cloth made from homespun yarn; Khaddar movement—a movement to boycot imported cloth fabrics.
KHADI ... ... See KHADDAR.
KHADIR ... ... The catechu tree (*acacia catechu*).
KHANDSARI ... ... Broker, contractor.
KHARBUZA ... ... Melon.
KHARIF ... ... The autumn harvest; crops sown in the beginning of the the rains and reaped in October—December.
KHATEDAR ... ... The occupier or owner of a field.
KHATTI ... ... A grain pit.
KHET-BAT ... ... Field by field.
KHEWAT ... ... The record or register of the shares in which a village is distributed.
KHUDKASHT ... ... KHUD (self) and KASHT (cultivation); land cultivated by the proprietor, i.e., part of the home farm.
KIARI ... ... A field surrounded by a bank or *bund*.
KIKAR ... ... See *Babul*.
KOLHU ... ... A crushing mill.
KOLI ... ... The name of a low caste of Hindus.
KULACHAR ... ... Family usage or observance.
KURK AMIN ... ... An officer employed to attach a property and realise the proceeds.
KURO ... ... A measure of grain (approximately 20-lb. weight).
KUS ... ... A grass weed (*poa cynosuroides*).
KUTCHA ... ... Inferior or bad [lit., not solid].
KUTCHRA ... ... Refuse, rubbish.

LAKH ... ... One hundred thousand.
LATIFUNDIA ... ... Large estates.
LINGAYAT ... ... A sect; followers of Siva.

MADRAS MEASURE ... 2½ lbs. (unhusked rice).
MAHAJAN ... ... Merchant.
MAHAL ... ... A district or province.
MALIK(A) ... ... A cultivator possessing an hereditary or proprietary right in an holding.
MAMULI ... ... Ordinary.
MANDI ... ... A market.
MATIARI ... ... Clay soil mixed with a small proportion of sand.
MAULVI ... ... A learned Muslim; a teacher.
MAUND ... ... A weight of 82·28 lbs. (*pucca maund*); has different values for different commodities and for the same commodity in different places.
MELA ... ... A religious fair; MAGH MELA—a fair held in MAGH January—February.
MISTRI ... ... A mechanic, carpenter, blacksmith, etc.
MOFUSSIL ... ... The country as opposed to the town.
MOTA ... ... A well tapping an underground stream.
MOTH ... ... The kidney bean (*phaseolus aconitifolius*).
MONG (MUNG) ... Green grain (*phaseolus radiatus*).

NAIB ... ... A deputy or assistant.
NAZARANA ... ... A gift; a contribution in excess of the usual payment.
NIM (NEEM) ... ... A large forest tree (*azadirachta indica*).
NULLAH ... ... A water course.

PALKI ... ... A palankeen.
PANCHAYAT ... ... Literally a committee of five; used to describe an association of any number of persons, instituted for objects of an administrative or judicial nature.
PANDIT... ... ... A learned Brahmin, a teacher.
PAR ... ... Rice land.
PARGANA ... ... A district; an administrative unit.
PASI ... ... A low caste of Hindus whose occupation is extracting the juice of the *tari* palm.
PASSIM ... ... In all directions.
PATNI PATNIDAR ... See PATTI.
PATRI ... ... A strip of land.
PATTI ... ... A division of land, held by co-sharers, into separate portions or strips. *Patnidar, Pattidar*—a co-sharer.
PATWARI ... ... A village accountant or registrar.
PEON ... ... A messenger.
PHAGUN ... ... The name of a month (mid Feb.—mid. March).
PIE ... ... One-twelfth of an anna.
PUCCA ... ... Solid, correct, complete, &c. (the contrast in all respects to *Kutcha*).
PURDAH ... ... A veil, screen; the practice of keeping women secluded.
PUS ... ... The name of a month (Dec.-Jan.).

QURA ... ... A plot of land.

RAB ... ... A stage in the conversion of cane juice into sugar; also the practice of burning leaves, sticks, etc., on land before sowing.
RABI ... ... The season of spring; crops sown in autumn and reaped at the end of the cold weather.
RAGI ... ... An inferior variety of millet (*eleusine coracana*).
RAJBUHA ... ... Canal, distributary.
RAMAYAN ... ... A dramatic epitome of the adventures of Rama.
RATOON ... ... A crop which, instead of being freshly planted each year, is allowed to grow up on the old stools for one or several years in succession (a common practice in sugarcane cultivation).
REH (REHALA) ... Land impregnated with sodium salts and thereby rendered barren.
ROTKARA ... ... A cook.
RYOT ... ... A cultivator.
RYOTWARI ... ... The system of tenure under which the revenue is paid by the cultivator direct to Government.

SAL ... ... A forest tree (*shorea robusta*).
SALOTRI ... ... A horse doctor.
SAMITHI ... ... A committee or society. *Seva Samithi*—a society formed for the public service.
SANAD ... ... A charter, certificate of honour.
SANAI (SANN) (SUNN)... Bombay hemp, a leguminous fibre crop (*crotalaria juncea*); also used as a green manure.
SARSON ... ... An oil seed (*brassica campestris*).
SASTRA (SHASTRA) ... A scripture; a work of authority, e.g., the writings of the six schools of Hindu philosophy.
SAWAI ... ... An excess of one-fourth; interest at the rate of 25 per cent.
SEER ... ... A weight (2.057 lb.).
SENJI ... ... A fodder crop (*melilotus parviflora*).
SHISHAM ... ... A forest tree (*dalbergia sissu*).
SHROFF ... ... A money changer, a banker.
SHUKKAR ... ... Sugar.

SIR ... ... Home farm land; the personal, family or private holding of a proprietor or co-sharer.
SIRAS ... ... A forest tree (*albizzia lebbek*).
SLOKA ... ... A verse.
SORGHUM ... ... A genus af grasses the most important of which is juar, the great millet (*sorghum vulgare*).
SOWCAR ... ... A moneylender.
SUDDER (SADR) ... Chief, foremost.
SUPA ... ... A basket for winnowing grain.
SURRA ... ... A disease affecting horses and camels especially.
SWADESHI ... ... *Swa* (own) and *desh* (country).

TACCAVI ... ... An advance made by Government to cultivators for agricultural purposes.
TAHBAZARIA ... ... A tax levied on sellers of articles in a bazaar.
TAHSIL ... ... A local revenue division of a district.
TAHSILDAR ... ... A revenue officer in charge of a tahsil.
TAL (TAHL) ... ... A dam.
TALUQDAR ... ... A big landowner.
TAULA ... ... A weighman.
TAUNGYA ... ... Temporary cultivation in jungle clearings.
THAKUR ... ... A person of Rajput descent.
THANA ... ... A police station; a post.
THARU ... ... Designation of people occupying villages in the Tarai on the borders of Rohilkhand.
THOK ... ... A local division of village lands.
TONGA ... ... A horse or bullock carriage.
TONGAWALLAH ... The driver of a tonga.
TORIA ... ... Rape (*brassica campestris*).

USAR ... ... Land impregnated with sodium salts and thereby rendered barren.

VAID ... ... A practitioner of one of the Indian systems of medicine.
VAKIL ... ... A lawyer.

WAQF (WAKF) ... A dedication of property by will or by gift for the benefit of society.

ZAMINDAR (ZEMINDAR) A landowner, a peasant proprietor.
ZILLADAR ... ... The revenue officer in charge of a group of villages.

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